

AUTOMOTIVE INDUSTRIES

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Automotive Industries



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(connecting load shaft and rotating load gear) 10. Idler gears (die

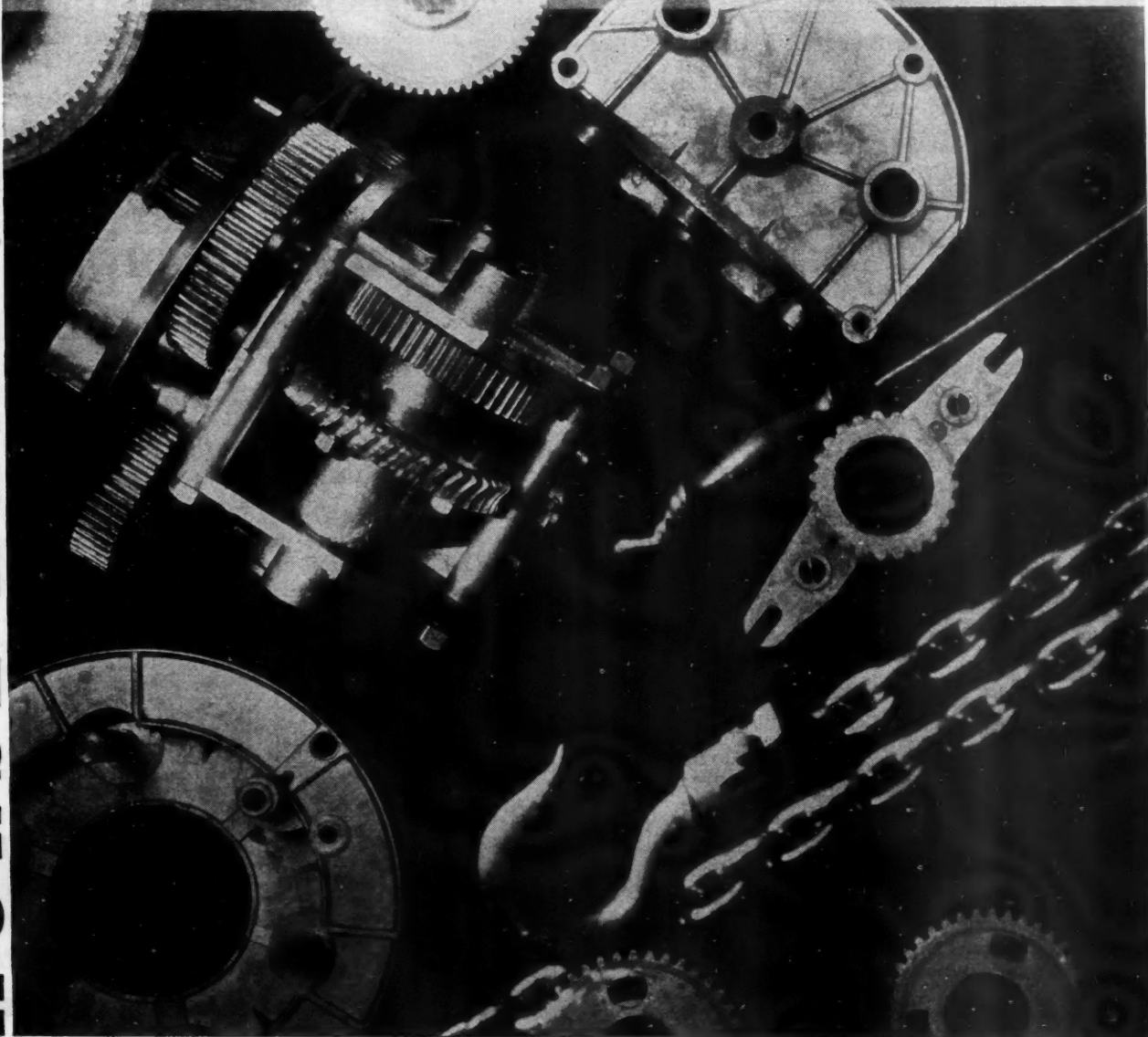
cast on steel pinion) 11. Frame (carrying idler gear studs)

12. Frame (carrying worm wheel shafts) . . . 13. Worm wheel shaft and

gear (steel insert) . . . 14. Worm wheel . . . 15. Grease sleeve . . . 16. Brush

holder . . . 17. Switch frame . . . 18. Switch wheel . . . 19. Cam arm

(steel pin insert) All Horse Head Zinc die castings



Long-Heralded Store-Door Freight Service Due Soon



Project of 16 railroads starts Oct. 17 after 10 years of snarling between shippers, rails and truck companies

New York area program approved by Federal Courts

Terminal trucking companies may fit into picture with little difficulty, since rails do not plan to use their own trucks

by G. Lloyd Wilson

Professor of Commerce and Transportation,
Wharton School, University of Pennsylvania.

ANOTHER chapter in the amazing, tumultuous and exasperating history of store-door freight service will draw to a close on Oct. 17, when the 16 trunk-line railroads and terminal railways serving New York commence the long-heralded and much discussed and litigated store-door freight services.

For nearly 10 years the subject of store-door pick-up and delivery of freight in the New York area has been a bone over which the shippers, the railroads, the truckmen, and various organizations representing these groups have snarled. Shippers have sought store-door freight services; the railroads, fearing complications in their already complicated relations with shippers, with other railroads, and with trucking companies, have procrastinated, putting off as far as possible the inevitable day of reckoning; and the trucking companies have viewed the matter with alarm and suspicion, won-

dering how the new order of things would affect them.

Negotiations between the trunk-line railroads and the spokesmen of shippers of New York have been conducted for the past several years by the Atlantic States Regional Advisory Board, an organization of shippers in which the leading shippers of the Middle Atlantic States are represented by their traffic officers. Representatives of the operating departments of the railroads in this territory serve as a contact committee to facilitate the handling of railroad freight service matters by conference with the shippers.

A special committee of shippers of the New York area of the Advisory Board prepared a plan of store-door freight service for the New York terminal district and collaborated with a special committee of railroad officers in working out the details of a store-door freight service that would be mutually satisfactory to



the shippers and the carriers. The plans worked out by the shipper and carrier representatives, after apparently being completed, were withdrawn by the carriers and the matter reviewed by the executives of the Eastern railroads. The store-door freight service plan threatened to complicate inter-railroad competitive relationships and to further jeopardize the precarious position of the Railway Express Agency, Inc., the railroad-owned successor to the American Railway Express Co.

The railway executives studied the matter and cogitated upon it while the members of the Shippers Advisory Board fumed at the delay. Several quarterly meetings of the Advisory Board slipped by without satisfactory explanations by the railroads as to the cause for the delay and without any expressions as to when, if ever, the matter would come out of the "pickling committee."

A spokesman of the impatient shippers at one of the Advisory Board meetings, at which railroad executive officers were conspicuously absent, gave voice to his dissatisfaction with the way the railroads were handling the question, and said, very significantly, "When store-door freight service was first requested by the board, the shippers were asking the railroads to perform a service that was a needed and attractive service. Since that time, however, the terminal and long-distance motor carriers have supplied the door-to-door service in connection with all-highway freight services to an extent that meets the requirements of shippers and consignees.

"The shippers are no longer seeking something they need and wish of the railroads; they have what they need now; they are now indicating to the railroads what must be done by the railroads if they wish to regain any of their past freight traffic." This remark is significant because it indicates just exactly what has happened in the store-door freight service situation in the past half-dozen years.

Then the railroads announced their plans! Opposition came from an unexpected quarter—from the terminal companies which for many years had served sections of New York, particularly in the Brooklyn area. These companies have paid thousands of dollars to railroads for their services in receiving and delivering inbound and outbound freight shipments at their extensive terminals. Four of these terminal companies, representing an investment of \$20,000,000 in terminal facilities, sought an injunction in the United States Federal Court against the carriers' store-door freight services.

The injunction was denied by the Federal Courts,* and the railroads proceeded with their plans which were announced in tariff filed on Sept. 15 with the Interstate Commerce Commission to become effective Oct. 17, 1932. The period intervening between the date of the announcement and the date of commencement of the service is due to the requirements of the Interstate Commerce Act which provide that at least 30 days must elapse between the date of filing and the effective date of all tariffs, excepting when special permission is given by the Interstate Commerce Commission to publish tariffs to become effective upon shorter notice is given to meet emergency conditions.

The present New York Store-Door Freight Service plan is set up and ready to go on Oct. 17. Rules and regulations governing the service and the charges to be made for the store-door pick-up and delivery services are recorded in a special tariff published by W. S. Curlett, agent of the Trunk Line Tariff Bureau, and participated in by the 16 trunk-line and terminal carriers serving the New York terminal district. These roads include the Baltimore and Ohio; the Central Railroad of New Jersey; the Delaware, Lackawanna and Western; the Erie; the Lehigh Valley; the Long Island; the New Jersey and New York; the New York and Long Branch; the New York Central; the

*Page 248, *Automotive Industries*, August 20, 1932.

Time-Honored Freight Restrictions Doomed?

".... motor trucking, that iconoclast of transportation, has shattered the ancient laws of shipping...."

New York, Ontario and Western; the New York, Susquehanna and Western; the Pennsylvania; the West Shore; the Bush Terminal Railroad; and the New York Dock Railway.

The collection and delivery services are performed in the Borough of Manhattan, south of 181st Street; in the Borough of Bronx, south and west of 177th Street, Tremont Avenue and the Bronx River; in the Borough of Brooklyn; and in the Borough of Queens; in New York City, and in 65 cities and towns in New Jersey in the vicinity of New York. These cities and towns are too numerous to mention, but the following list is representative and indicates the territory in which the store-door freight service will be performed: Carteret, Clifton, East Orange, Elizabeth, Hackensack, Harrison, Hoboken, Jersey City, Kearney, Linden, Montclair, Newark, Nutley, Orange, Passaic, Paterson, Perth Amboy, Rutherford, South Amboy, South Orange and Weehawken.

The railroad carriers have perfected arrangements to pick up outbound shipments of freight at the store-doors of shippers to be drayed to the railroad freight stations and to deliver inbound shipments from the stations to consignees' store-doors in the boroughs of New York and in the nearby cities and towns upon the request of the shippers or consignees.

The railroads will use for this service selected trucking companies, which will act as agents of the railroad carriers and under the control of the latter. The railroads do not intend to use their own trucks.

The store-door collection and delivery services are offered to shippers and consignees of freight in carload quantities only. The shippers are required to notify the railroad carriers if they wish outbound shipments collected in ample time to enable the carriers' cartage agents to perform the pick-up in accordance with the closing hours of the places of business and of the railroad freight stations. The entire outbound shipment aggregating at least one carload of freight must be available in one working day, and each carload must be consigned to one consignee at one destination. Ordinarily each carload shipment must be available at one place to be picked up. Special provision is made for picking up part-carload lots at different places, subject, however, to additional charges.

The outbound freight will not be accepted unless it is available at one place on the sidewalk, at street level, or at the truck platforms of the shippers, if the platforms are accessible to the truckers' vehicles. Neither collection nor delivery services will be performed where the streets are inaccessible, unimproved or impassable for the carriers' vehicles.

Shippers are required to furnish the labor necessary to assist in the prompt loading of the vehicles used to pick up the outbound shipments.

Inbound shipments must be consigned in the bills of lading and shipping orders for "C & D Service" (Collect and Delivery Service) and show the address at which the delivery is to be made. If the shipments are not so consigned and addressed, the delivering carriers must be notified, upon the arrival of the goods at destination or at the terminal yards serving the places of destination, where the truck deliveries are to be made; notice must be given in sufficient time prior to the arrival of the shipments to enable the goods to be diverted for "C & D Service." Extra charges are assessed for the diversion service.

The consignees must be in position to accept delivery of the shipments when tendered by the truckmen. Deliveries are made only during the usual daily business hours, and at one place on the sidewalk street level or truck platform when accessible to the truckmen's vehicles. Consignees must furnish the labor necessary to assist in the prompt unloading of the vehicles. If

(Turn to page 440, please)

Renovation of Transportation

"....store-door freight service marks significant milestone in transportation history of U. S...."



Automobile Body Lines Tailored by an

As the architect plans a house so the automobile could be designed, with a unified treatment of lines and disposition of masses

SINCE the automobile body clothes the car with eye appeal, its tailoring is a job for the rare individual with a feeling for line and decoration. If streamlines based upon scientific research could be put over now, there would be little need for a stylist. But Henry Dreyfuss feels, as do many body designers, that the good public isn't ready yet for a radical switch from the accustomed.

Why couldn't the gap be bridged smoothly, subtly, be a carefully planned design program? Choose an arbitrary period of say five years in which the body lines would gradually merge into the desired mold. Interestingly enough, something of the same idea was expressed by outstanding body experts recently ⁽¹⁾.

With this approach, the goal could be attained at a minimum of die investment because the press equipment could incorporate the needed flexibility for progressive style changes. If streamlines happen to come sooner, the transition could be effected so much more smoothly under this arrangement.

Because of his success in creating industrial design of wide public acceptance, Mr. Dreyfuss has been asked to design bits of ornament, hardware, and the like, to dress up some of the current cars. But this leaves much to be desired from the designers' point of view. Can harmony in design be achieved by slapping on dabs of even the most pleasing ornament or gadgetry?

Doesn't the real answer lie in some uniform treatment of lines and disposition of masses conceived by one individual in much the same fashion as an architect plans a building? It would embrace the body, hood, radiator, fenders and hardware; it would extend to body color and interior trim. Truly a challenging prospect.

Much can be done in the way of details. For instance, since the projected design is based upon free-flowing

lines, all disturbing elements such as headlamps, license plates, etc., should be faired in so as to merge with the general sweep of the structure.

By the same token, exterior hardware such as door handles should be flush with the panel planes by sinking them into a suitable depression. Concealed door hinges, frequently a topic of discussion among body designers, would be a part of the scheme.

Each make of car should express its own individuality—unobtrusively of course—but unmistakably. This distinctiveness could be stamped indelibly in characteristic lines, color treatment and ornament.

That other people are thinking somewhat along the same lines is evidenced by the brief note in *Automotive Industries* ⁽²⁾ recently.



Since the design is based on free-flowing lines, headlamps, license plates, etc., should be faired in so as to merge with the general sweep

To create the impression of length and speed, vertical lines might be entirely eliminated by closing up the door-frame joints, using concealed hinges, avoiding vertical striping and ornate belt molding. Then Mr. Dreyfuss suggests a novel color treatment to heighten the effect. Instead of contrasting or complementary colors and shades, why not apply the same hue overall and provide contrast by means of dull and gloss finish? Thus the areas below the belt might be glossy—above the belt, dull.

An interesting variation of this theme might be the use of

broad bands of color running horizontally, in alternate stripes of the same color, in gloss and dull values.

Although eye appeal as well as good taste depends upon the follow through of a design idea, this vital principle seems to be sorely neglected. Take, for example, several new models exhibited at the last automobile show. The higher-priced models had lines molded to a distinctive motif. But the cheaper models of the same make were hybrid to say the least. Certainly the union of a rakish radiator and hood ensemble with a last year's square cut body was not a happy one.

¹ Short Cuts May Blaze Trail to New Designs Without Excessive Cost, by Joseph Geschelin. *Automotive Industries*, July 30, 1932.

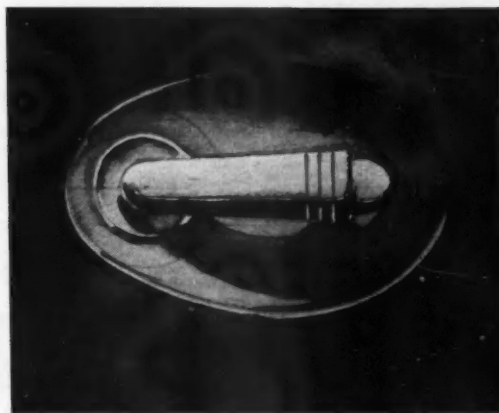
² Just Among Ourselves, Page 197, *Automotive Industries*, August 13, 1932.

Industrial Artist

AS TOLD TO
Joseph Geschelin
by Henry Dreyfuss

Henry Dreyfuss was for several years art director of the Strand Theater, New York, and created a new stage setting each week. He did all the scenes for "Cat and the Fiddle," "The Last Mile," "Fine and Dandy," "Sweet Stranger" and many other productions, and is now doing the scenery for the forthcoming "Forward March."

He has made great strides in industrial design. He is the creator of the new Big Ben clock, is consulting designer for the



Careful attention to hardware will make it a part of a whole

Bell Laboratories and his recent products include peanut butter jars, airplanes, steamship cabins, door hinges and locks, stoves, Pullman cars, automotive accessories and many other products.



To create the impression of length, vertical lines might be entirely eliminated

Wheels should blend in the general decorative scheme. Even when the car is standing at the curb, the impression of power and speed must be expressed by the wheels. The new colored tires will help greatly in allowing designers to create color harmony and make the wheels fit into the picture as they never have before. Wheels for a sober town car, of course, will differ in design and color treatment from those of a roadster. But with modern construction every type of vehicle can be fitted with the wheels which most perfectly assist in its appearance and performance.

If we agree with some eminent automotive engineers that one way of stimulating sales is to keep people dissatisfied with what they have, isn't it time to get busy on a definite program? A sound plan looking to the future may bring about a needed revolution in design, subtly, and without excessive capital outlay.

Effects of Various Factors on Wheel S

by Dr.-Ing. R. Wichtendahl

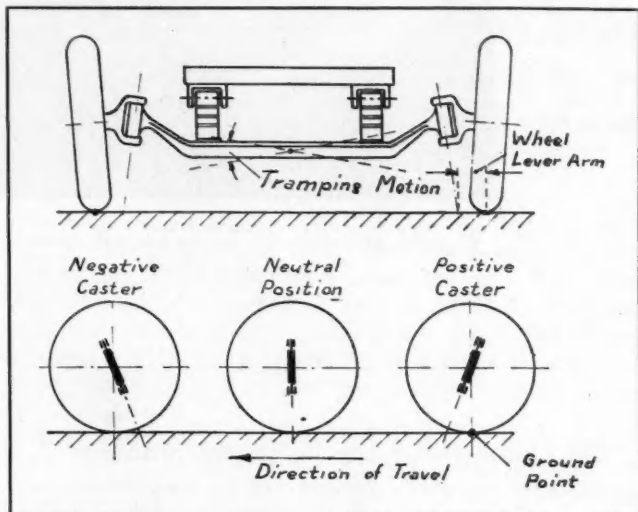
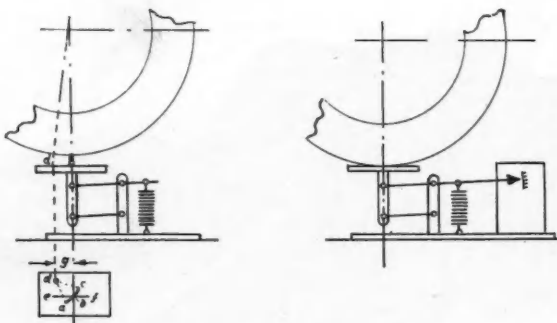


Fig. 1—Diagram illustrating terms used

AN entirely new Hano-mag car of the 4/20 hp. series shimmed intolerably, while the great majority of the cars of this series gave no trouble of this kind. It was also observed that some cars, after leaving the assembly chain, tramped very perceptibly on the dynamometer rollers (Fig. 1). These same cars ran perfectly smoothly on a poor road. On the other hand, a car which shimmed on the road remained quiet on the rollers. The task of investigating these phenomena was assigned to the writer.

It was a comparatively easy matter to explain the tramping vibrations on the dynamometer rollers, and to eliminate them. Since the rollers are perfectly round, and therefore do not impart to the wheels shocks that might induce these tramping vibrations, it was obvious that unbalance of the wheels was the cause, especially as the phenomenon occurred only at high speeds of the front wheels, corresponding to about 55 m.p.h. road speed. As a matter of fact, replacement of the wheels by a set that had previously been completely balanced, eliminated the trouble in every case.

To determine the difference between two new stock cars which behaved similarly on the rollers but differently on bad roads, ex-



Figs. 2 and 3—Apparatus for tracing motion of ground point of tire on road and determining rise and fall of axle as front wheels are deflected from straight-ahead course

act measurements were taken on both cars on a surface plate, of the camber, toe-in, etc. As was to be expected, only slight variations were found, entirely insufficient to explain the difference in the behavior of the cars with respect to shimmy. In addition, the frictional resistances in the steering mechanisms of both cars were measured by blocking up the front axles and determining the forces which it was necessary to apply to the front wheel at its circumference in order to move the steering wheel. Here a material difference was noted between the good and the bad car. With the good car it was impossible to move the steering wheel from the front wheel, hence the

worm-type steering mechanism was self-locking, while there was no self-locking effect in the bad, shimmying car. This would seem to point the way to a very simple elimination of shimmy, but it is evident that self-locking of the steering mechanism is no prevention of the phenomenon of shimmy; it merely prevents the transmission of shimmy to the steering wheel.

I was familiar with a 10/50 hp. N.A.G.-Protos car which had been run about 30,000 miles and did

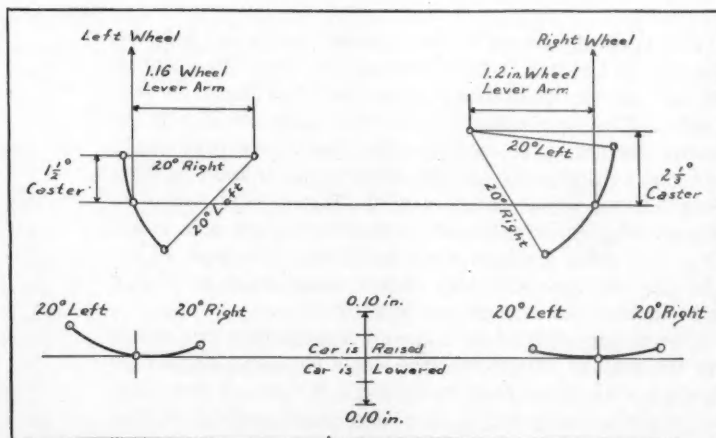


Fig. 4—N.A.G. steering gear characteristics

Shimmy Studied With Electric Recorder

Increase in lateral inclination of knuckle pivot axis and removal of front spring bushings abolished shimmy

not shimmy. A similar investigation of this car showed that the steering gear was quite reversible, and that with the front axle blocked up, a light pressure of the finger on the front tire sufficed to move the steering wheel. It was plain, therefore, that with this steering gear no shimmy-inducing forces occurred, and that this was dependent upon the design.

In order to get a general perspective of the camber and toe-in in different cars, measurements were made with the small auxiliary apparatus illustrated in Figs. 2 and 3. The car on which measurements were to be made was blocked up at front and rear on a surface plate, in such a manner that it was horizontal again, and the auxiliary apparatus, which was similar to a letter scale, could be placed under the front wheels. A pin was pressed into the tire, and the lightly braked wheel was turned around its axis in such a manner that the head of the pin represented the lowest point of the wheel, that is, the theoretical point of contact between wheel and road (hereinafter referred to as the ground point). This ground point contacts with the plate of the scale, and when the steering wheel is turned and the front wheels are deflected, the pin-head describes a curve on the plate (*a, b, c*, Fig. 2). This curve can be made plainly visible by simple means. By trial it is then an easy matter to determine the point of rotation *d*, that is, the point of intersection of the knuckle-pin axis with the rolling

surface. If the front wheels are placed in the straight-ahead position (point *b* of the curve *a-b-c*) and the wheel is slightly turned around its spindle, the straight line *e-b-f* is inscribed on the plate, which, aside from a possible casting effect, represents the direction of

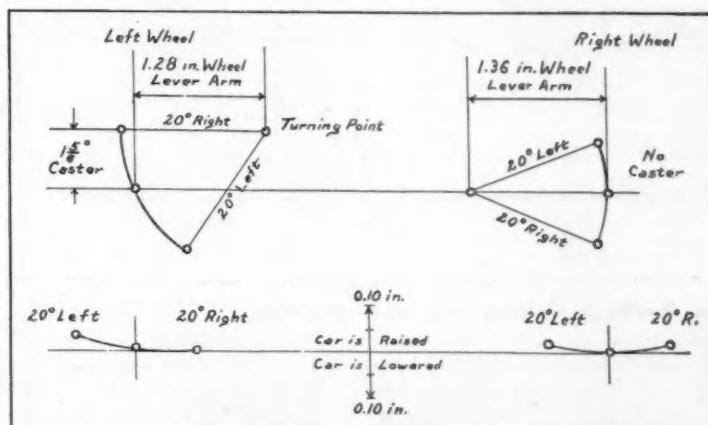


Fig. 6—Hansa steering gear characteristics

travel. From the distance *g* and the radius of the wheel it is possible to determine the positive or negative caster of the wheel by means of simple trigonometrical operations.

In addition, the apparatus was used to determine the rise and fall of the axle with deflections of the wheel, as may be readily seen from Fig. 3. Since during the measurement the front axle was blocked up and was therefore stationary, the apparatus in each case measured the distance between the ground point and the surface plate, which determines the rise and fall of the axle. These measurements were made on seven different makes of vehicle, as follows: N.A.G.-Protos, Adler, Hansa, Mercedes-Benz, Buick, Chrysler, Hanomag.

Figs. 4-10 show the results obtained. In all measurements the right wheel was deflected 20 deg. toward the right and left. Of the seven cars investigated, several others besides the Hanomag gave shimmy trouble, but they need not be mentioned here. In connection with the further investigation it may be pointed out, however, that the N.A.G.-Protos

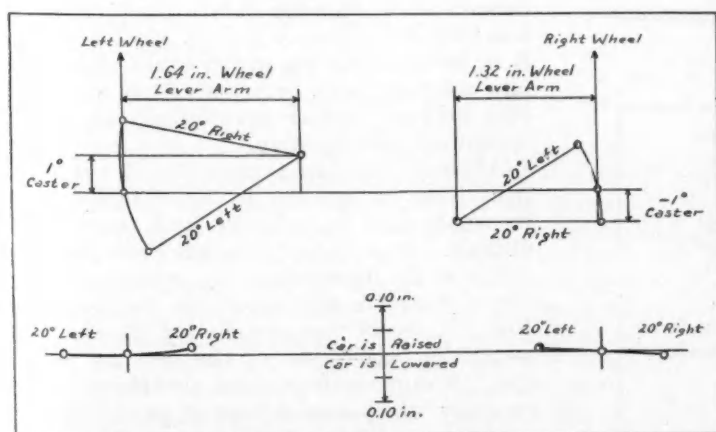


Fig. 5—Adler steering gear characteristics

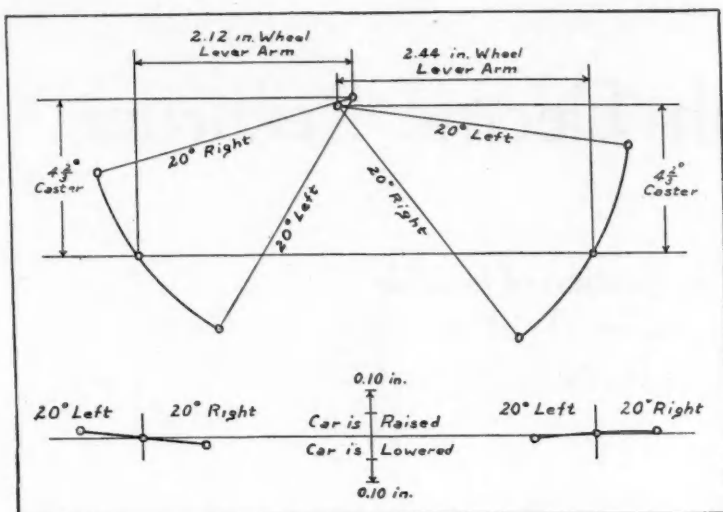


Fig. 7—Mercedes-Benz steering gear characteristics

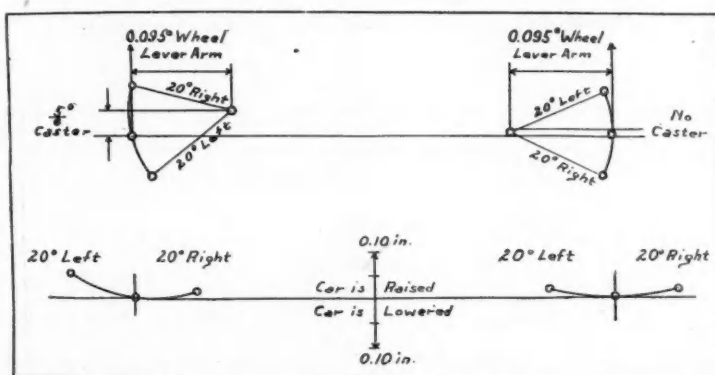


Fig. 8—Buick steering gear characteristics

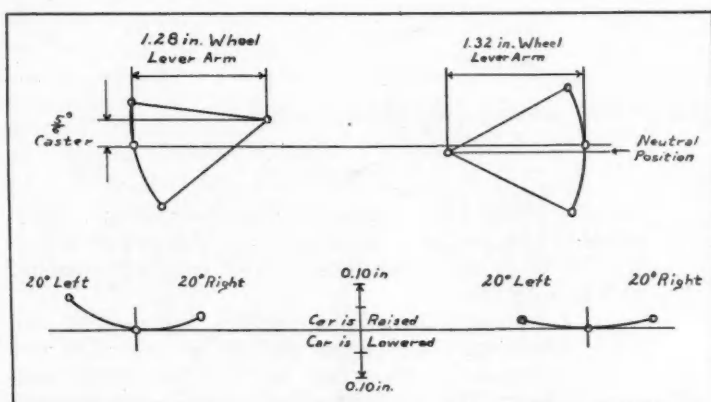


Fig. 9—Chrysler steering gear characteristics

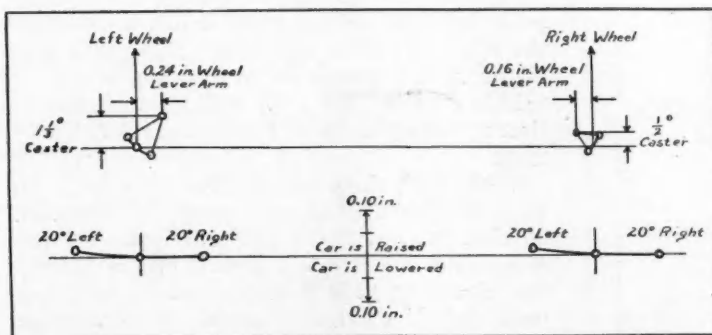


Fig. 10—Hanomag steering gear characteristics

car was practically free from shimmy, even on very bad roads. As may be seen from Fig. 4, in the N.A.G.-Protos, the axle assumes the lowest position when the car runs straight ahead, and is raised when the wheel is deflected to the right or left. This property, which was not shared by all of the vehicles investigated, becomes pleasantly apparent in driving, in that when the wheels are deflected, they return automatically to the straight-ahead position.

A comparison of the measurements shows that in all of the cars with the exception of the Hanomag there is a greater or lesser distance between the point of intersection of knuckle-pin axis with the ground and the ground point. With simple means the Hanomag was so changed that in it, too, there was a considerable distance between these two points. But road tests with the car after this change had been made did not show any apparent improvement.

In order, now, to obtain a true picture of shimmy vibrations on bad roads, an electric vibration indicator was developed which was to record on a strip of paper all important motions of the front axle and front wheels during a run. Fig. 11 shows this electric vibration recorder for two measuring points diagrammatically. A high-tension current is produced by means of battery *a*, interrupter *b*, and spark coil *c*, and this current is carried to the measuring point, *I* or *II*, by a cable *d*. At measuring point *I* the up-and-down motion of body *A* with respect to a stationary body *B* is to be measured and recorded on a paper strip in the measuring apparatus. Cable *d* is connected to the metal part *e* which is embedded in a hard-rubber rod *r* secured to the body *A*. In the position shown in the drawing, the high-tension current carried to the metal part *e* must jump across to cable 4, and is returned by this cable to the measuring apparatus, where, at the end of cable 4, it must jump once more to the ground rod *g*. If body *A* moves up and down, the metal part *e* slides past the cables 1-6, and the spark jumps to the cable 1-6 in accordance with the position of *A*, and in the measuring apparatus from cable 1-6 to the grounded rod *g*. If a thin paper strip *h* is allowed to pass in the measuring apparatus between the ends of the cable and the grounded rod *g*, the spark produces a curve of holes in the paper strip. In this way the motion of body *A* relative to body *B* is inscribed on the paper strip with absolute accuracy as to both magnitude and time. Any desired number of motions can be recorded on a single strip.

Although the basic principle of this electric vibration recorder is exceedingly simple, its application in practice was found quite difficult. After many attempts, however, success was finally attained in producing faultless curves with this apparatus during a run. Fig. 12 shows the installation of the first measuring apparatus in the test car, while Fig. 13 shows a four-point electric vibration recorder which was developed as a result of experience with the first instrument.

With this electric vibration recorder more

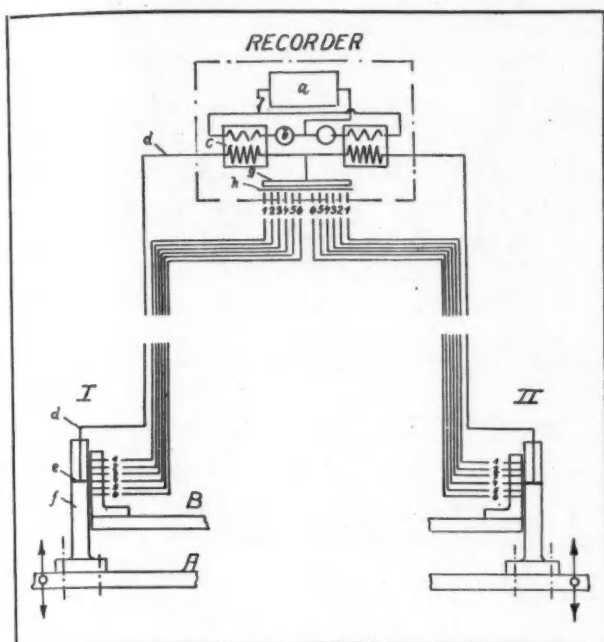


Fig. 11—Circuit diagram of electrical vibration recorder

than 50 test runs were made, all measurements being made on one and the same rough road at the same speed of 50 km. (31 m.p.h.). In each test run three motions were recorded, namely,

1. Measuring point I—Up-and-down motion of the front axle at the left wheel.
2. Measuring point II—Up-and-down motion of the front axle at the right wheel.
3. Measuring point III—Flapping motion of the front wheels (shimmy).

The installation of the measuring points on the test car is shown diagrammatically in Fig. 14. Measuring points I and II give a record of the character of the road surface, and measuring point III shows the relation of the road surface to shimmy. It would have been possible to record still other important motions of the front axle, but it was not the object of the investigation to make a thorough scientific study of shimmy, but to find as soon as possible an effective cure for it.

First of all, a series of test runs were made with the Hanomag test car, all over the same route and at a speed of 31 m.p.h., during which the following factors were changed systematically:

1. Pressure of inflation of tires.
2. Shock absorber.
3. Caster of axle.
4. Distance between knuckle-pin axis and ground point (wheel lever arm).

Four vibration records from this series (runs 4, 5, 11 and 22), are reproduced in Figs. 15 to 18. In the description of the electric vibration recorder it was pointed out that the apparatus records the curve in the form of a series of small holes, which are produced by the penetration of sparks (100 sparks per sec.) through the paper strip. This curve was gone over with a lead pencil and thus made clearly visible.

Fig. 15 represents a run with the test car with stock camber and toe-in, without shock absorbers, with 26-lb.-per-sq.-in. tire pressure. Curves I and II, which represent the up-and-down motions of the front axle, show plainly the poor character of the road

Table 1
Effect of Tire Pressure on Shimmy

Run No.	Tire Pressure	Caster	Wheel Lever Arm	Shock Absorber	Remarks
1	26	plus 0.5	0.2	Yes	No difference
2	15				
4	25	plus 0.5	0.2	No	No difference
3	15				
5	26	plus 0.5	1.6	No.	Slightly less shimmy with 5
6	15				
8	26	plus 0.5	1.6	Yes	Less shimmy with 8
7	15				
9	26	plus 5.0	1.6	Yes	No difference
10	15				
12	26	plus 5.0	1.6	No	No difference
11	15				
13	26	plus 5.0	2.0	No	Slightly less shimmy with 14
14	15				
16	26	plus 5.0	2.0	Yes	Slightly less shimmy with 16
15	15				
17	26	minus 5.0	2.0	Yes	Slightly less shimmy with 17
18	15				
20	26	minus 5.0	2.0	No	Slightly less shimmy with 20
19	15				
21	26	minus 5.0	1.6	No	No difference
22	15				
24	26	minus 5.0	1.6	Yes	No difference
23	15				
N.A.G.-Protos					
27	30	plus 2.0	1.2	Yes	Slightly less shimmy with 27
28	22				
30	30	plus 2.0	1.2	No	No difference
29	22				

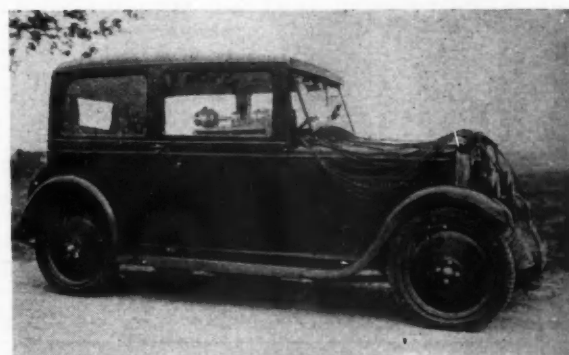


Fig. 12—Hanomag car with vibration recorder ready for test

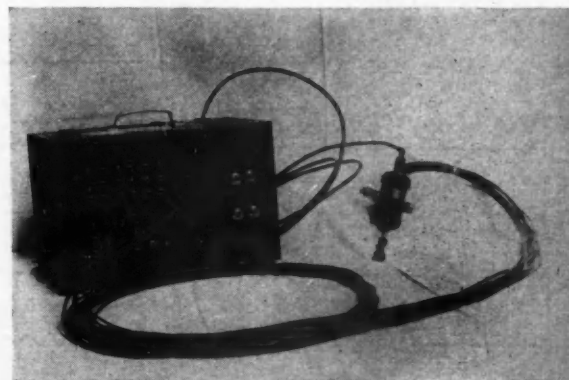


Fig. 13—Four-point electric vibration recorder

Table II
Effect of Shock Absorber on Shimmy

Run No.	Shock Absorber	Caster Degrees	Wheel Lever Arm sq. in.	Tire Pressure lb. p. sq. in.	Remarks
1	Yes	Plus 0.5	0.2	26	Less shimmy with 1
4	No				
2	Yes	Plus 0.5	0.2	15	Less shimmy with 2
3	No				(Difference greater than between 1-4)
6	Yes	Plus 0.5	1.6	15	Slightly less shimmy with 7
7	No				
5	Yes	Plus 0.5	1.6	26	Less shimmy with 8
8	No				
9	Yes	Plus 5.0	1.6	26	Less shimmy with 9
12	No				
10	Yes	Plus 5.0	1.6	15	Less shimmy with 10
11	No				
15	Yes	Plus 5.0	0.2	15	Slightly less shimmy with 15
14	No				
16	Yes	Plus 5.0	0.2	26	Materially less shimmy with 16
13	No				
17	Yes	Minus 5.0	0.2	26	Less shimmy with 17
20	No				
18	Yes	Minus 5.0	0.2	15	Slightly less shimmy with 18
19	No				
23	Yes	Minus 5.0	1.6	15	Slightly less shimmy with 23
22	No				
24	Yes	Minus 5.0	1.6	26	Less shimmy with 24
21	No				
25	Yes	Plus 0.5	1.6	26	Less shimmy with 25
26	No				
N.A.G.—Protos					
27	Yes	Plus 2.0	1.2	30	Slightly less shimmy with 27
30	No				(Almost no difference)
28	Yes	Plus 2.0	1.2	22	Slightly less shimmy with 28
29	No				(Almost no difference)

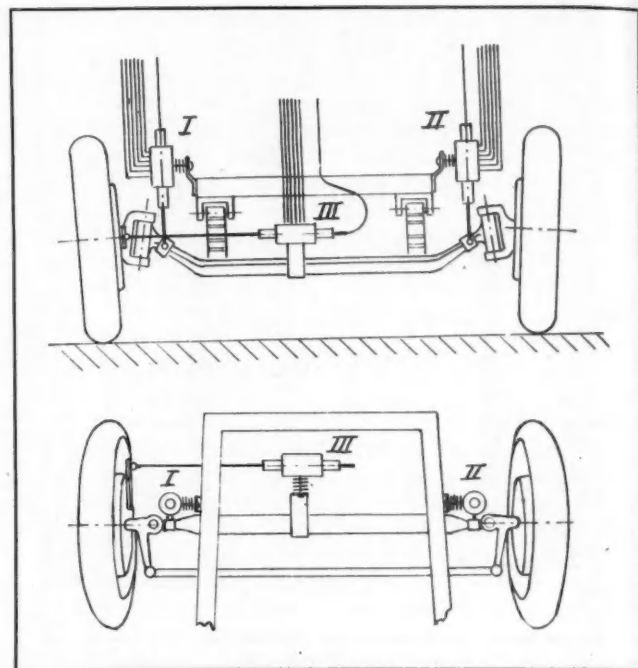


Fig. 14—Installation of vibration-recording apparatus on test car

Figs. 15 to 17—Vibration records from different cars, one-sixth actual size. Marks in the lines represent time intervals of one second and distances of 45.6 ft.

Fig. 15

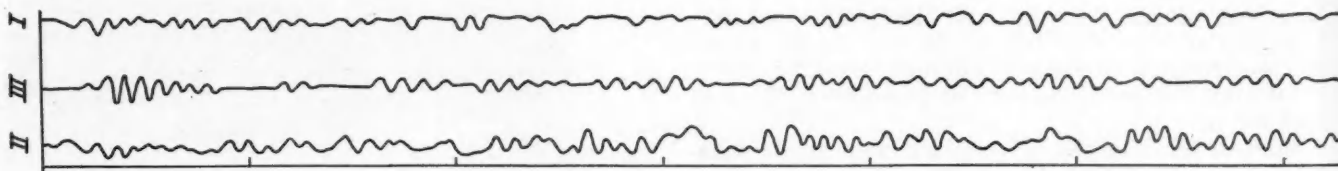


Fig. 16

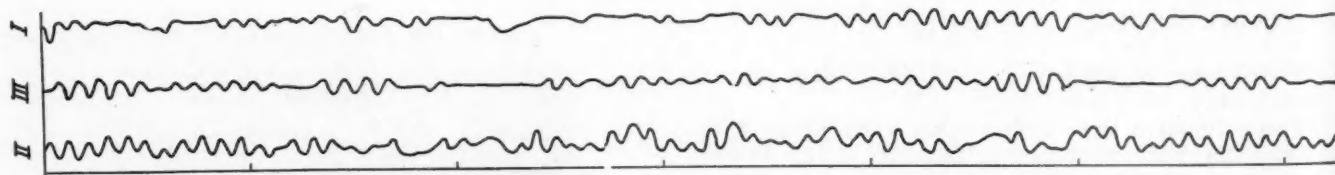


Fig. 17

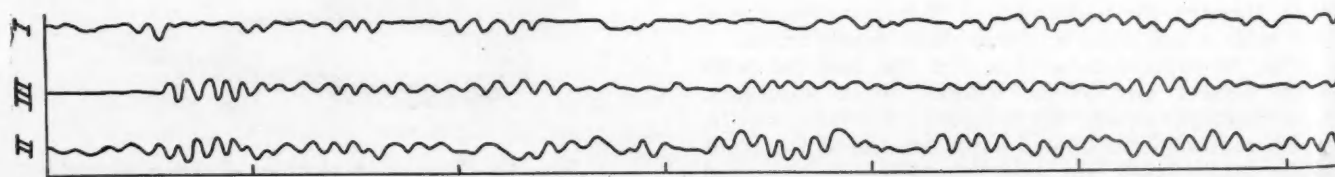


Fig. 18

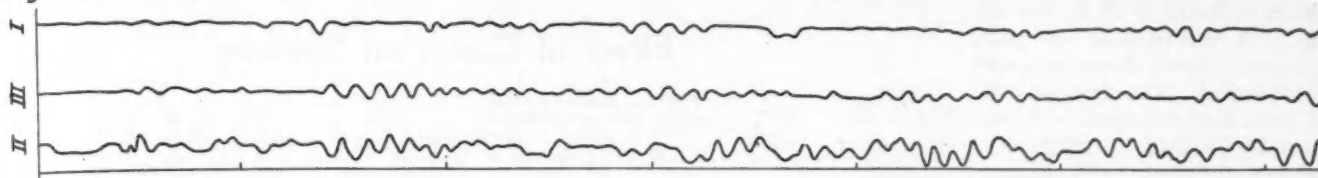


Fig. 19

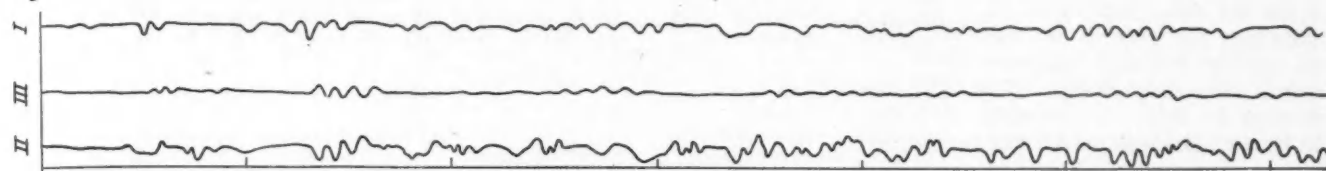


Fig. 20

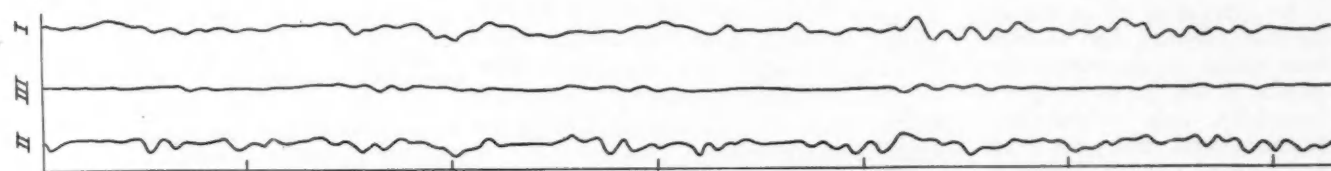
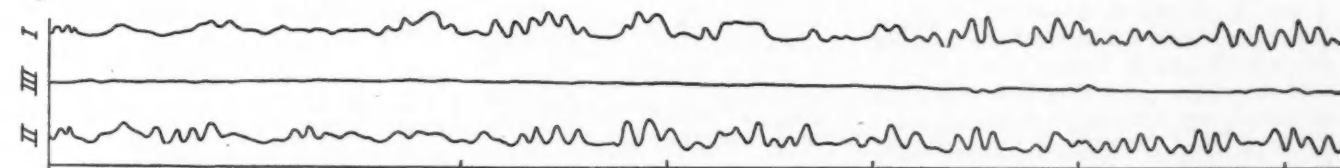


Fig. 21



Figs. 18 to 21—Vibration records from different cars, one-sixth actual size. Marks in the lines represent time intervals of one second and distances of 45.6 ft.

and indicate that the tramping motions attained an amplitude of about 1 in. above and below, and that one cycle of the tramping vibration occupied about 1/20 sec. Curve III shows plainly the shimmy vibration due to the poor road conditions, which are not

unimportant with respect to amplitude and number. The maximum deflection amounts to about 8 deg. toward the right and the left; a complete cycle of shimmy or flapping motion also took about 1/20 sec.

Run 5, represented by Fig. 16, differed from Run

Table III

Effect of Wheel Lever Arm on Shimmy

Run No.	Wheel Lever Arm	Caster	Shock Absorber	Tire Pressure	Remarks
1	0.2	Plus 0.5	Yes	26	Less shimmy with 8
8	1.6				
2	0.2	Plus 0.5	Yes	15	No difference
7	1.6				
3	0.2	Plus 0.5	No	15	No difference
6	1.6				
4	0.2	Plus 0.5	No	26	No difference
5	1.6				
16	0.2	Plus 5.0	Yes	26	Slightly less shimmy with 9
9	1.6				
15	0.2	Plus 5.0	Yes	15	Slightly less shimmy with 10
10	1.6				
14	0.2	Plus 5.0	No	15	Slightly less shimmy with 11
11	1.6				
13	0.2	Plus 5.0	No	26	Slightly less shimmy with 12
12	1.6				
17	0.2	Minus 5.0	Yes	26	Slightly less shimmy with 24
24	1.6				
18	0.2	Minus 5.0	Yes	15	Slightly less shimmy with 23
23	1.6				
19	0.2	Minus 5.0	No	15	Slightly less shimmy with 22
22	1.6				
20	0.2	Minus 5.0	No	26	No difference
21	1.6				

4 in that the tire pressure had been reduced to 15 lb. per sq. in. A comparison of both shimmy curves shows no great differences. The shimmy conditions had not improved materially in Run 11 (Fig. 17), which differed from Run 5 only in that the axle was set for a 5-deg. caster.

On the other hand, Fig. 18, showing the record of Run 22, shows a slight improvement. The only change with respect to Run 11 was that in Run 22 the axle had 5 deg. of negative caster. However, shimmy is by no means eliminated.

By comparing all of the vibration records, an attempt was made to determine the effects of tire pressure, shock absorbers, axle camber and distance between pivot axis and ground point on shimmy. For instance, comparisons were made of records of Runs 1 and 2, 4 and 3, 5 and 6, which differed from each other only with respect to tire pressure. The data thus obtained are compiled in Tables I-IV. Comments on the behavior of the car during the different runs are made in the last column of each table, and it is not necessary to further discuss the results here. Although there were certain differences in front-end behavior between the test runs 1 to 24, not one of the combinations tried brought a satisfactory solution of the shimmy problem.

As a result of theoretical considerations and observations on other cars, the next step taken was to remove the bushings from the spring eyes of the two front springs, so that the spring bolts had a great deal of clearance in the spring eyes. Of course this arrangement can be regarded only as a makeshift. Test runs conducted with this loose spring connection (Runs 25 and 26), showed a material improvement (see Fig. 19, test run No. 26). This record must be compared with that of Run 5, as the two differed only with respect to the method of spring connection.

Wear of Tires on Trailers is Investigated

AN investigation made by the Timken-Detroit Axle Co. is said to have shown that the flexing of trailer axles under load results in undue wear on the tires with which these trailers are fitted.

The flexing of the axle tilts the plane of the tire, which has the same effect as cambering of an axle, resulting, in the words of the Rubber Manufacturers' Association, "in an unnatural wiping of the inside shoulders and in breaking down of the fabric and premature failure."

The Timken company states that giving the trailer axle an initial reverse camber does not prevent the trouble. The obvious remedy is to so design the axle

Table IV

Effect of Caster on Shimmy

Run No.	Caster	Wheel Lever Arm	Shock Absorber	Tire Pressure	Remarks
1	Plus 0.5				Small but numerous deflections Better { Greater amplitude but Best { better damping
16	Plus 5.0	0.2	Yes	26	
17	Minus 5.0				
2	Plus 0.5				Most numerous but small deflections Less numerous but greater deflections —18 better than 15
15	Plus 5.0	0.2	Yes	15	
18	Minus 5.0				
3	Plus 0.5				3 and 14 both very bad, numerous large deflections Also large deflections, but better damping
14	Plus 5.0	0.2	No	15	
19	Minus 5.0				
4	Plus 0.5				First two not bad, largest deflections in 13 Considerably more quiet
13	Plus 5.0	0.2	No	26	
20	Minus 5.0				
5	Plus 0.5				No difference between 5 and 12 More quiet stretches
12	Plus 5.0	1.6	No	26	
21	Minus 5.0				
6	Plus 0.5				No difference between 6 and 11 Slightly better
11	Plus 5.0	1.6	No	15	
22	Minus 5.0				
7	Plus 0.5				No great difference, but 10 better than 7 and 23 still better
10	Plus 5.0	1.6	Yes	15	
23	Minus 5.0				
8	Plus 0.5				No great difference but 9 better than 8 and 24 still better
9	Plus 5.0	1.6	Yes	26	
24	Minus 5.0				

With the object of further improving the results, a new front axle with a greater lateral inclination of the knuckle pivot axis was built. Fig. 20 shows the record of a run with this new axle, loose spring connection, long wheel lever arm, and shock absorbers, which was practically free from shimmy.

For purposes of comparison the electric vibration recorder was installed also in the N.A.G.-Protos car already referred to, and of the test records obtained in the runs with it, Fig. 21 shows that of Run 25, which brings out the shimmyless character of the run.

The foregoing discussion shows that by comparison of a series of front-axle designs and systematic test runs with an electric vibration recorder it was possible in the case in hand to get rid of front-wheel shimmy.

that its deflection under load will be a minimum, and with this end in view the trailer axles of the Timken company are made of the tubular type which are said to combine maximum strength and rigidity with light weight.

In the investigation made it was found that trouble from excessive tire wear is likely to be particularly great if a change from solid rubber to dual pneumatics is made on the same axle.

This results in an increase in the tread and a consequent increase in deflection under load. The results of the investigation have been compiled in a book recently published by the company.

JUST AMONG OURSELVES

"Reeves Defends Banks—" But it's Clifford

IN the September issue of *The American Mercury* is an article entitled "A Brief for Bankers," by Clifford B. Reeves. Mr. Reeves, the magazine states, "was graduated from the Wharton School of Finance and Commerce of the University of Pennsylvania, and has worked on newspapers in Philadelphia and New York. He is now in Wall Street."

All of which leaves out a most important fact about Clifford B., namely, that he is the son of Alfred Reeves, N.A.C.C.'s vice-president and general manager.

The article, incidentally, is forceful, sensible and very interesting. It defends the bankers against some of the unreasoning onslaughts which have been hurled at them, but points out that there are bankers and bankers and that there are a number of things about the banking business which might well be changed. And every opinion in it is backed by a set of facts.

Government Helps Upset View of Facts

AMONG other interesting comments from the Reeves article, the following seems particularly worth repeating:

"Failure to differentiate between true income and capital appreciation is one of the basic recurring weaknesses of our economic system. Ironically enough, the fatal confusion between the two is fostered by the government itself, which taxes capital appreciation as income.

"If the man who made \$100,000

speculative profit considered his income to have been increased thereby only \$5,000 annually—that is, by the amount that this sum, conservatively invested, would produce—much of our present business instability would be eliminated."

It will be worth your while to get the whole article and read it.

Car Makers Not Eager to Retail

THERE is a general feeling among dealers and around the industry in general that depression has brought about considerable financial participation by passenger car factories in dealer and distributor operations.

Some trend in this direction undoubtedly has taken place, but information which we have obtained confidentially in recent weeks leads to the belief that the trend is not nearly so great as is generally believed. A very large increase in wholesale financing figures points to one way in which increase of capital needs have been supplied. And a very full realization by the factories of the hazards of the retail business furnishes a potent reason against any more participation in such activities than possibly can be avoided.

We are assured by the sales manager of one of the largest independent factories, for example, that his organization does not have a single dollar invested in any distributorship. Another concern of similar size is participating financially in less than ten instances—all of which they hope to be out of as soon as possible.

And there has been great care exercised by Motor Holdings, G. M. subsidiary, in any recent increases in participation in dealer finances, we are reliably informed.

There are more ways than one of helping distributors and dealers financially, to be sure. But taking into account all methods, there is probably far less factory participation in retail operations from that angle than general rumor would indicate.

"Everything on Rubber or in Air—"

EVERYTHING in the future will travel on rubber or in the air," we heard William B. Mayo, ex-Ford chief engineer, say recently. He didn't amplify the idea to any great extent but we gathered that he thought the railroads would continue to function, going to rubber-wheeled vehicles and, perhaps, back to shorter and more frequent trains.

Can Junking Plans Be Junked?

DEPRESSION has brought under new scrutiny factory reserves-for-junking plans. With many factories entering into the junking reserve idea reluctantly to begin with, it is natural that the efficacy of the idea should be further questioned as need for profits at the factory became greater.

Generally speaking, pressure for elimination of the plans has been coming from the financial departments of the various companies, with the sales departments, by and large, insisting that they are a necessary part of their merchandising plan. It is probable that the sales departments will win in most cases.

It is evident, however, that the junking plans will not be forgotten, to run on forever without periodic questioning.—N.G.S.

Chronolog Records Productive and Loss

Visible and printed record keeps employee and management continuously informed

Fig. 1—The Chronolog, a new instrument to record and allocate idle time



A POTENTIAL solution for the control and decrease of idle time on machinery and processes is embodied in the "Chronolog," an instrument developed and produced by the National Acme Co. of Cleveland, and to be marketed by the Graybar Electric Co.

It is an instrument which provides a continuous and cumulative record of what has happened in connection with any run of identical operations, subject to interruptions, whether it be on a machine tool, on an inspection fixture, in a paint shop, in a wrapping department, etc. It records the idle time, in minutes, that has accumulated during the run; the reasons for long periods of idle time; it records the productive time, and provides a count of the number of pieces produced.

Thus it performs a number of functions for production management, shop supervisory staff and operators. Of special importance to the operator are the following:

1. It keeps the operator constantly informed as to what he has produced.
2. It helps him to earn more money by revealing the causes of idle time.
3. It supports his complaints and requests by giving the facts. He can more clearly demonstrate when machine repairs are needed.
4. Gives him an immediate count of pieces produced so that he will not be penalized for over-runs (without making it necessary for him to count pieces). Similarly

it will prevent under-runs. If the operator is in charge of several machines it warns him by flashing a red light when any machine has run out of stock.

5. Reduces machine repair, cleaning and set-up time by showing how long these operations take.

6. If he is one of a group and shares in a group bonus it keeps his fellow operators up on their toes—he can easily check what the other fellows are doing. Thereby it also helps to increase the spirit of co-operation between operators.

SUPV, FOREMAN, CLERK OR INSPECTOR'S KEY NO.	OPERATOR'S KEY NO.	Clock Time	Idle Time SYMBOL	Idle Time	Production Minutes	Units Produced
74	1215	7.30		0	0	0
		7.35		5	5	5
		7.40		10	10	10
	1216	7.41	+	11	11	11
		7.45		15	15	15
NK		7.50		20	20	20
		7.55		25	25	25
		8.00		30	30	30
	1215	8.05	E	30	30	30
	1216	8.06	E	31	31	31
MD		8.10	E	34	34	34
		8.15	E	39	39	39
	1215	8.19	S	13	31	31
		8.20	S	14		
		8.25	S	15		
MO		8.30	S	24		
	1215	8.33	S	27	31	31
		8.38	S	29		
		8.40	S	34		
		8.45	S	39		
MO	1215	8.47		41	31	31
		8.50			34	34
		8.55			39	39
		9.00			44	44
		9.05			49	49

Fig. 2—A "sample" record, interpreted in the accompanying article. A roll of record paper normally lasts about a month

Time of Operator

In addition to the visual record, the Chronolog prints at predetermined intervals a cumulative record on a roll of paper, which reveals to the foreman or shop superintendent precisely when an interruption occurred, why it occurred, and how long it delayed normal production.

A third product from the Chronolog is the "Chronocard," which can be printed at any time and shows the cumulative record up to that time. This, together with the chronorecord for more detailed analysis, offers to the management a convenient and accurate set of facts from which productivity can be increased and production costs lowered. In addition to

1. Giving management promptly a true record of what is going on in the shop in printed form, requiring no measurement or interpretation, it also

2. Throws into prominence the major causes of wasted time so that these causes can be studied and reduced. Thereby it

3. Eliminates alibis and conflicts of opinion in many cases, and

4. Also enables management to decide intelligently when and where added equipment or replacements will show a profit.

Further it provides management with an excellent intermediate inventory control, particularly important where stockrooms are not maintained for finished pieces, as in most automobile plants.

6. For the parts manufacturer the advantage of preventing over and under-runs is readily apparent, especially where automatic machinery, such as screw machines, is used.

7. It provides management with a more ideal set of facts on which to base time setting—and a set of facts which the operator can understand, eliminating dissatisfaction.

8. Further it will tend to show up bad foremen in the shop, thereby assisting in the problem of personnel control.

While other applications for which the Chronolog records can be used may be readily apparent, these are sufficient to indicate the broad scope of this novel instrument which can be applied to practically any machine or operation which is subject to interruption. Fig. 1 shows the instrument itself without control switches. At the far left on the face of the Chronolog are two pilot lights. The upper shows whether current is supplied to the instrument, the lower whether the instrument is functioning or not. It lights when the on-and-off switch immediately to the right and slightly above is turned on by the operator upon his arrival.

Before he can turn this switch, however, he must insert his "key," which carries his number in type, in the machine. Such a key is shown to the right and



Fig. 3—The Chronolog is adaptable to many other uses aside from machinery. Here it is shown attached to an inspection fixture at the National Acme Co. This particular installation is used for setting the pay rate of a group of machines and operators, ahead of this inspection

back of the switch. When it is inserted and the switch turned on, a record is immediately printed from the register wheels—in this case it will print the operator's number, the correct time, and (at the start of a production run) 10 zeros under the columns for "idle minutes," "productive minutes," and "production units." From then on the Chronolog will print a cumulative record at predetermined intervals.

In addition to this automatic recording, there is a supplementary means of printing through the dial shown in the center of the machine. This dial is provided with letters corresponding to reasons for idle time, etc.

The symbols register "in" in the first column to the right of "clock time" on the record. Not showing visibly on the dial (similar to the printing of the operator's key number) is another column in which is printed the key number of whoever is at the machine, aside from the operator. A separate slot for such keys is provided to the left of the operator's key.

Fig. 2 shows a sample record. The top line shows that operator No. 1228 arrived at his machine at 7.30. In the next 10 minutes he produced 10 pieces without idle time. At 7.41, foreman (key No. 74) visited the machine and recorded that fact by inserting his key and depressing the printing lever on the dial. The record shows the work proceeding.

Inspector "NK" arrives at 8.05, and at 8.06 has ordered a shutdown for tool grinding, which the operator records by dialing "E." The machine now automatically begins to count and record idle minutes and stops counting productive minutes.

It evidently took the operator only 13 minutes to grind his tools, for at 8.19 he dialed "S" because he wanted his reground tools certified by the set-up man. From 8.20 until 8.33 he was evidently hunting or waiting for the set-up man "MO," who arrived at that time and recorded the fact. It took the set-up man until 8.47 to set-up and inspect.

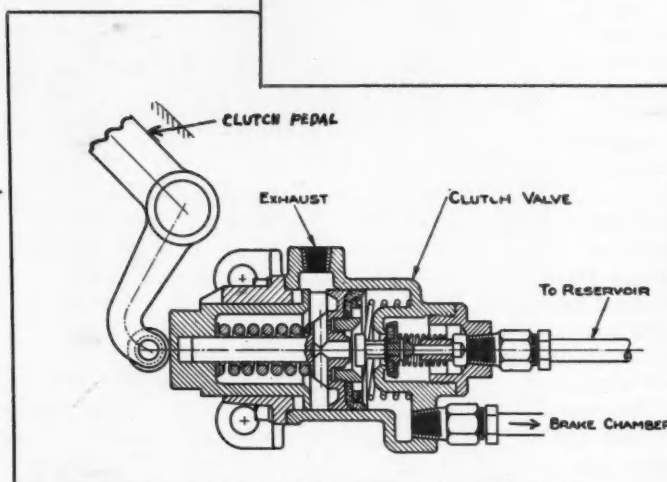
(Turn to page 440, please)

Bendix-Westinghouse Contributes to Automobile Progress With—

Air Clutch Control

Emergency Brake Equipment

This equipment actuates the brakes automatically in case of a break in the tubing



The new air-clutch control eliminates the linkage problem between the pedal and clutch throw-off

EQUIPMENT

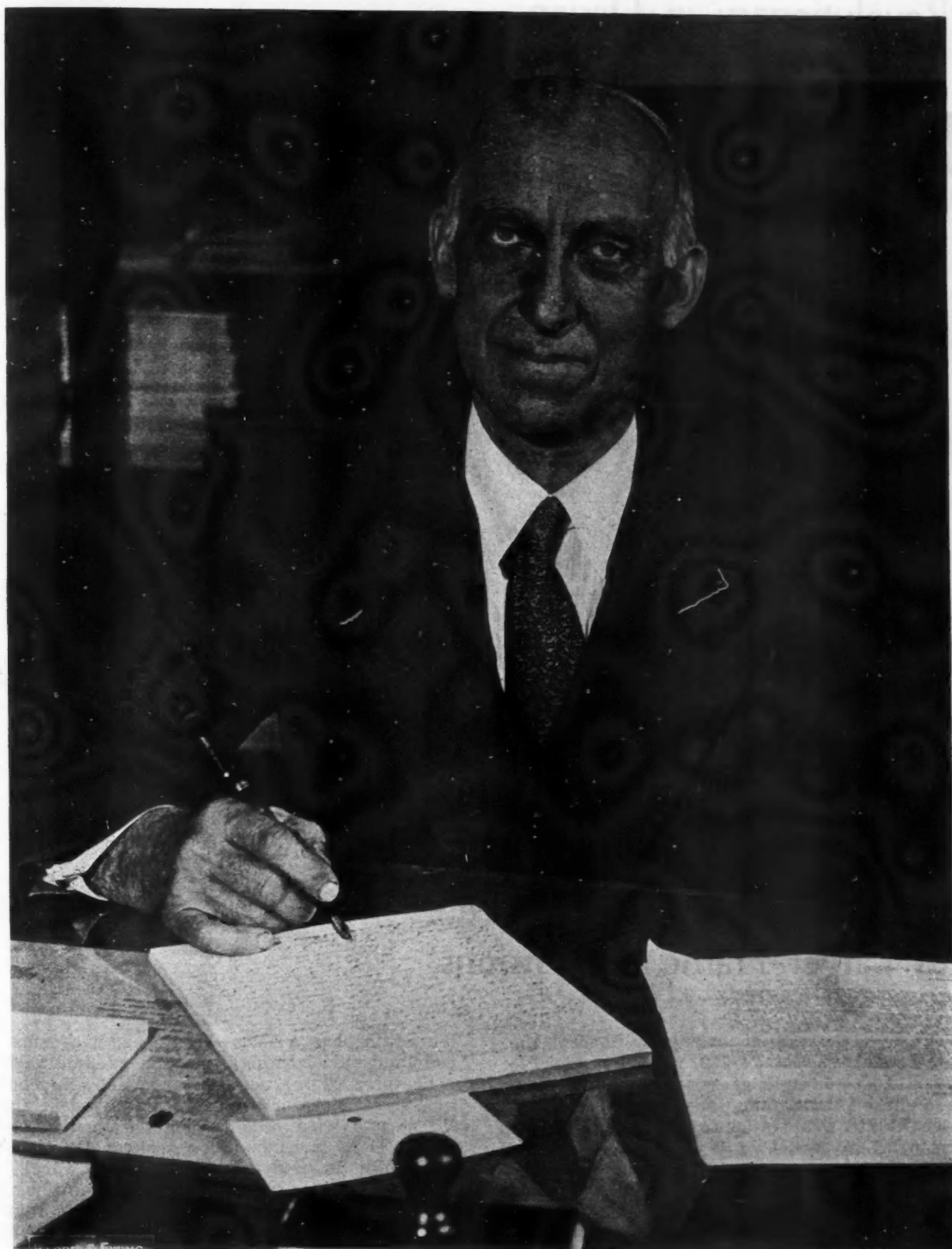
for operating friction clutches by compressed air has been developed by the Bendix-Westinghouse Air Brake Co. for use on heavy buses and trucks. The sizes of powerplants are constantly increasing, and the new equipment is designed to practically eliminate muscular effort in clutch operation. Aside from other advantages, the air clutch control eliminates the linkage problem between the pedal and the clutch throw-out shaft, gives the operator more leg room by permitting pedal travel to be reduced to as little as 4 in. and still maintains the same degree of control as the conventional mechanical hook-up. As shown in the accompanying diagram, the air clutch control valve may be operated directly through the conventional clutch pedal, while the chamber operating the throw-out shaft may be mounted directly on the clutch housing. Although primarily designed and recommended for factory installation, air clutch control is also available for field installation through distributors of the Bendix-Westinghouse company.

ENGINEERS of the Bendix-Westinghouse Air-Brake Company have developed a special emergency brake equipment which assures that the brakes of the vehicle are applied automatically in case of a break in the tubing or hose from the truck frame to the front or rear brake chambers. This emergency equipment is particularly valuable for application to truck and trailer combinations. It will give an automatic emergency brake application on the truck or trailer, or both, in the event of line breakage—as may result from collision or other causes. Several

large oil companies are operating approximately one hundred units equipped with special emergency features. Successful operation in this service, for more than the period of a year, is said to have proved the merits of this innovation in automatic brake control in emergencies.

It was pointed out in these columns some time ago that every new industrial development requires some form of protection during its earlier stages, and it now seems that the infant high-speed Diesel engine industry will enjoy a certain amount of protection from the fact that its product uses a fuel on which no tax is being levied at the present time. There is little doubt that as soon as any considerable fraction of all buses or trucks operate on heavy fuels, these will be taxed the same as gasoline, for the maintenance of highways is attended with great expense, and the authorities certainly would not allow any considerable proportion of road users to escape payment of their fair share of this expense by using an unconventional fuel. But for a long time to come furnace oil, the usual fuel of high-speed Diesels, is likely to be used in much greater quantity for domestic and industrial than for transportation purposes. This will make it difficult to collect a tax on this fuel, or on such portion of it as is used for road transportation, which will tend to prolong the period during which the automotive Diesel engine will continue to benefit from the use of a tax-free fuel.

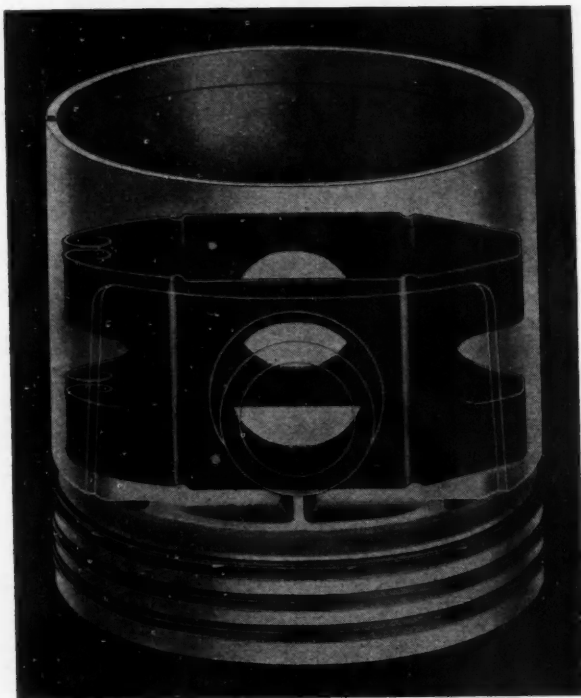
Dickinson Slated to Be S. A. E. President



Dr. H. C. Dickinson

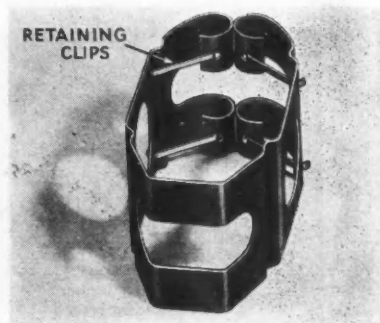
Veteran scientist and official of the United States Bureau of Standards has been nominated to head the Society of Automotive Engineers' official family for the 1933 year. (See page 432, this issue.)

Perfect Circle Piston Expander Is Revolutionary in Design



A NEW product has just been announced by the Perfect Circle Co., manufacturers of Perfect Circle Piston Rings. This new product is a piston expander which is for installation inside used aluminum pistons.

New type Perfect Circle expander showing its application



Its chief function is to restore the piston to its original fit and stop even the worst cases of piston slap.

Many thousands of miles of road work and laboratory testing went into the invention and perfection of this new expander, which is different in design than any other expander on the market. The Perfect Circle expander, due to its central location inside the piston skirt, correctly expands the piston over the entire skirt, thereby assuring full cylinder contact. Other outstanding features of this expander are as follows: It is made of the finest spring steel; no machining is necessary for installation; the expander is securely locked in place by the piston pin; and it is unconditionally guaranteed.

The first expander to be developed is for the model A Ford, which uses a split skirt aluminum piston. Expanders for other cars are being developed at the present time. Due to the fact that all cars do not have the same piston design, new expanders will be developed for each different kind of car.

The new Perfect Circle product will be sold through the company's present distributing system, namely, automotive parts and equipment jobbers.

G. M. T. Announces Two Trailers With Larger Frame Dimensions

TWO new trailers are announced by General Motors Truck Co., the TT-252, replacing the TT-251, a 12,000-15,000-lb. gross vehicle weight semi-trailer, and the TT-418, four-wheel trailer, developed from the TT-218 semi-trailer to replace the 16,000-lb. former TT-426 model.

The TT-252 has a one-piece frame of the automobile drop type, bottle-necked at the kick-up. With much larger frame dimensions than the TT-251, which it replaces, the one-piece construction instead of the two-piece riveted design should also increase the strength, in spite of the fact that chassis weight is actually lower as a result of better metal distribution.

This has made possible the offering of this trailer in an additional tire size, 9.75/20 duals, compared with the standard 34/7 HS dual; with this tire size

the trailer has a 15,000-lb. rating, with maximum body and payload weight recommended of 24,980 lb.

Features of the new trailer include an enclosed type screw elevator which can be locked in any position, and with oilless bushings in the support arms. There is a new fifth-wheel construction, with a straight pin used in the upper fifth wheel, without provision for rocking. The rounded top of the lower fifth wheel, however, permits high angularities, so that the oscillating pin mounting won't be missed.

The upper fifth wheel consists now of a nickel steel pin, pressed and welded into a bolster carried in a reinforced plate extending across the frame, as may be noted from the illustration.

Axles are larger than on the TT-251 and square in section. There is an improved method of adjust-

ment for the support wheels. Heavier auxiliary springs have been supplied. Chassis weight is lower, tread is somewhat wider at $70\frac{1}{2}$ in. Frame section is $11\frac{15}{16} \times 3\frac{1}{2} \times \frac{1}{4}$ in., with six gusseted channel cross-members. Chassis weight distribution is 65 per cent of trailer axle as against 80 per cent formerly.

TT-418

The TT-418 four-wheel trailer is developed largely from the TT-218 semi-trailers by removing the support and elevator wheels and installing a gear frame, etc. Thus the new trailer is of the drop type, a fact which accounts largely for the lower weight made possible in spite of increases in frame and axle sections.

The sub-frame or gear frame which has been

added to the TT-218 has a $6 \times 2\frac{1}{2} \times \frac{1}{4}$ in. section as against a $5\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$ in. on the former TT-426, also. Further improvements include a tubular steel draw-bar, hinged to the outer edge of the chassis, reducing snaking. To it is clamped and welded an alloy steel eye.

The new trailer is available in 14-ft. and 16-ft. lengths, in addition to the 12-ft. size available only formerly.

Compared with the model it replaces, the new trailer has the same rating, with 32×6 in. dual tires. It has a somewhat narrower tread of $63\frac{7}{8}$ in., a $2\frac{3}{4}$ -in. square axle as against a 2×3 in. section; the main frame is $8\frac{3}{4} \times 2\frac{1}{2} \times \frac{1}{4}$ as against $6 \times 2\frac{1}{2} \times \frac{1}{4}$. Chassis weight is 2364 lb. as against 2500. With 6.00/20 in. tires (dual) recommended gross weight is 12,000 lb.

Viscosity Experiments in Progress, Prompted by Ministry of Transport

VISCOMETRY is one of the most interesting subsidiary subjects included among the activities of the metallurgy department, says *Engineering*, in a review of the work of the National Physical Laboratory, and the calibration of commercial viscometers for certification forms an important item among a wide range of miscellaneous test work.

This year, at the request of the Ministry of Transport, an investigation has been undertaken relating to methods of determining the viscosity of tars.

Experiments are now in progress to determine the absolute viscosity of various types of tar by the falling sphere method, so that observations made with Hutchinson and Redwood viscometers may be converted to absolute values.

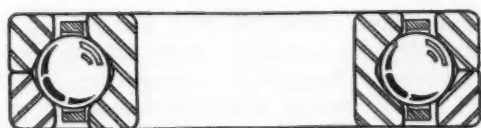
A related research concerns a redetermination, by a

new method, of the viscosity of water, which is likely to prove of much importance in view of the disparities among published values.

Instead of the usual capillary tube, the apparatus consists of a rectangular channel with walls of optical glass, so that the dimensions can be measured by interferometric methods. The flow of water is continuous, and a specially sensitive gage is being developed for measuring the minute pressure differences between the ends of the channel.

As a final example of a viscosity investigation with metallurgical applications, brief mention may be made of a research into the viscosity of molten metals which is shortly to be undertaken, and for which an oscillating-disk method is proposed.

Ball Bearing Designed for Thrust Loads in Either Direction



Sectional view of Norma CD duplex bearing

THE Norma-Hoffmann Bearings Corp., Stamford, Conn., announces an addition to its line of "Precision" bearings in its Type CD duplex double angular contact ball bearing. This unit has been developed to meet the need for a bearing adapted not alone

for radial loads but also for high thrust loads in either direction, with a width no greater than that of a standard, single-row ball bearing. The CD outer ring is made in two parts, and both inner and outer raceways are ground to a special curvature suitable for safely carrying heavy end thrust. A one-piece ball retainer of extruded bronze rides, or is carried, upon the ground flanges of the inner ring. The CD duplex bearings are available in the light, medium and heavy metric series in a range from 10 mm. to 100 mm. bore. They are to be used only where the thrust load exceeds the radial load, and the duplex outer ring must be clamped tight in the housing.

Automotive Oddities—By Pete Keenan

DOGS ARE MADE TO
HAUL AUTOMOBILES IN
SUMMER TO KEEP THEM

FIT, IN SASKATCHEWAN,
CANADA.



THE FAMOUS LONDON BRIDGE
HAS AS MUCH HORSE TRAFFIC
AS AUTOMOTIVE.



PORCUPINE PUNCTURED
AND NEARLY WRECKED
MERLE ELLISON'S CAR
Titusville, Pa., 1932.



A RAILROAD TRAIN AT
NIGHT GAVE COL. HENDERSON
THE INSPIRATION FOR THE
REVOLVING AIRWAY BEACON.

Write us if you know an oddity

The NEWS TRAILER

When the new Secretary of Commerce began driving his own little car in the interest of governmental economy in high places, we wonder if he recalled that day, 31 busy years ago, when a young man struggled with a curved-dash Olds in a record-breaking trip from Detroit to Gotham.

It took a week. (The gold-braided doorman of the swanky hotel demurred and wanted the mud-spattered driver to use the side entrance!) Today Roy Chapin probably qualifies as the Capital's most experienced driver.

".... because you are the world's fairest and most humane employer because you have befriended thousands of my countrymen" Count Ugo Berni-Canani told Henry Ford, and awarded him the Cross of Grand Officer of the Order of the Crown of Italy at the behest of Benito Mussolini and Victor Emanuel, rex.

"From the Ground Up," a moving picture.

Dramatis personae: Ores, Coal, Lumber, Fabrics, Sheet Metal, Castings, Cars and Trucks. Starring Canadian-built vehicles.

Directors: Automotive magnates.

Producer: The Dominion of Canada.

After a private showing under auspices of Canadian Automobile Chamber of Commerce for automotive executives, prints of the picture are being sent to Great Britain and trade commissioners in all Dominions. The picture is also being released to theatres in Canada. The purpose of the film is to demonstrate the extent of the automotive industry in Canada on a self-contained basis.

Fashions have taken to the air. Hats, cloaks, gowns and dresses are being rushed from New York to retail centers throughout the country to give department store buyers the low-down as soon as possible. (This adds "pre-pre-view" to the delight of adjective-fiends.)

Five years ago, thinking a nearby highway project would be completed immediately, Charles Mower ordered an automobile shipped to him. For five years all he could do was look at the car in his garage. Recently the highway was completed and Mower "gassed up" and took his first ride.

NEWS

Production of Cars Under \$1000 Gains

Estimates By Groups of Price Classes Shows Low-Priced Acceptance

PHILADELPHIA, Sept. 28—Estimated percentages of production of U. S. passenger cars since 1928 indicates a decided trend toward lower-priced groups, especially for cars selling under \$1,000, wholesale.

The cars wholesaling at \$500 and under showed a percentage gain of from 42.5 in 1928 to 62.5 per cent for the first seven months of 1932, with a high of 65.2 per cent for 1931.

The tabulation follows:

Estimated Car Production by Wholesale Price Classes	(Percentages of Total)				
	1928	1929	1930	1931	1932 7 Mos.
\$500 and under	42.5	54.1	60.8	65.2	62.5
\$501-\$750	30.3	27.3	23.1	20.3	24.4
\$751-\$1,000	11.5	8.1	6.9	8.0	7.8
\$1,001-\$1,250	8.2	5.1	4.3	2.7	2.1
\$1,251-\$1,500	3.2	2.1	1.8	1.2	1.5
\$1,501-\$2,000	2.7	2.0	1.9	1.7	.7
\$2,001 and up	1.6	1.3	1.2	.9	1.0
Under \$1,000	100.0	100.0	100.0	100.0	100.0
Over \$1,000	84.3	89.5	90.8	93.5	94.7
	15.7	10.5	9.2	6.5	5.3

Firestone Declares Regular 25c. Dividend

Common Payable Oct. 20, Keeping Stock on \$1.00 Basis, Directors Vote

AKRON, Sept. 27—Firestone Tire & Rubber Co. declared the quarterly dividend of 25 cents a share on common stock, payable Oct. 20 to stockholders of record Oct. 1.

The dividend keeps the stock on the \$1 yearly basis which has been maintained for the last year and a half. All other major rubber manufacturers of Akron have discontinued dividend payments on common stocks.

There are 2,115,000 shares of Firestone common stock outstanding, directors announced, and the dividend payment will amount to more than half a million dollars. Preferred dividends were not due for action.

Frank H. Hobson, vice-president of the Cleveland Trust Co., was chosen to succeed Harris Creech, president of the Cleveland Trust Co., as a member of the Firestone board of directors.

Rush Order Work Provides 530 Jobs

In Addition 51 Toledo Firms Recall 6000 Workers After Labor Day Holiday

TOLEDO, Sept. 27—Rush orders placed by manufacturers hastily planning new lines of motor cars caused the 51 major plants here to add 530 workers since September 12, and to increase both the length of the shifts and the working days per week.

This number is in addition to the 6000 recalled after the Labor Day holiday.

Another appreciable increase is likely after October 1, when Willys-Overland starts production of the new six-cylinder half-ton trucks for International Harvester Co., and various plants such as Electric Auto Lite, Spicer Manufacturing, Mather Spring Co., Tillotson Carburetor Co., and others increase schedules to provide units for its manufacture.

Doehler Die Casting Co. has recalled many workers due to new orders. August G. Gutmueller, vice-president and production manager, said:

"The automobile industry is starting to show signs of betterment and things look a lot brighter in the last week or two."

The City Machine & Tool Co. plant is being pushed to capacity at present to fill rush orders given by automobile manufacturers who have made important body changes in the last two weeks. The company has developed a new radiator shell which is pressed from one piece of steel, and it is bringing many orders.

Industrial Steel Castings Co. has been given new business by railroads and automobile plants, and the Toledo plant is being operated twice as many days each week as during the summer, J. L. Tillman, Jr., said.

Acklin Stamping Co. has added 100 workers in the last few weeks.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Sept. 29—General trade appears to be responding fairly well to seasonal influences. Wholesale business in textiles and shoes has particularly shown some seasonal revival.

The shoe manufacturers in all the big centers are busy, and the cotton mills are facing a good demand. The movement of fall goods is fair; but, on the whole, retail trade is somewhat irregular.

GUARANTY TRUST INDEX UP

The Guaranty Trust Company's preliminary index of business activity for August stood at 54.6, as against 51.9 for July and 73.8 a year ago. The Company's index of wholesale commodity prices on September 15 was 39.6, as compared with 37.5 a month earlier and 47.0 a year earlier.

FREIGHT LOADINGS

Railway freight loadings during the week ended September 10 totaled 501,824 cars, which marks a decrease of 165,926 cars below those a year ago and a decrease of 463,989 cars below those two years ago.

DEPARTMENT STORE SALES

The value of department store sales during August, according to the Federal Reserve Board, shows an increase of less than the estimated seasonal amount. The board's adjusted index number for August stood at 66, as against 67 for July and 71 for June.

MERCHANDISE EXPORTS

Merchandise exports during August amounted to \$109,000,000, as against \$164,808,000 a year ago. Imports totaled \$91,000,000, as compared with \$166,679,000 a year ago.

FISHER'S INDEX DOWN

Professor Fisher's index of wholesale commodity prices for the week ended September 24 stood at 62.4, as against 62.9 the week before and 63.2 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended September 21 were 24 per cent below those a year ago.

STOCK MARKET

The stock market at the beginning of last week continued its downward reaction, with the volume of transactions at a low level.

To Build Rear-Engined Car

Bremac Corp. Reported to Have Radical Design

DETROIT, Sept. 28—Articles of incorporation have been filed for the Bremac Motor Car Corp. of Detroit. Capitalization consists of \$150,000 paid-in capital and 30,000 shares of no par value.

The company is reported to be developing a radical rear-engined automobile with exceptional performance characteristics.

Steel Orders Show Steady Increases

Volume Slack, But
Inquiries Excite
Interest of Mills

NEW YORK, Sept. 29—Order books of steel producers are making a better showing from day to day.

While the rate at which the volume of demand is growing is decidedly leisurely, definite gains have been so consistent in the last few days that there is general faith in the continuance of the upward trend.

A story is making the rounds of the market that several large automotive consumers have been sounding the market with a view to covering their first half 1933 requirements of bolts and nuts.

While it is impossible to lay one's hands on any forward commitments of this sort, there certainly is more disposition on the part of some consumers to consider covering the remainder of their 1932 requirements for such descriptions of steel as might offer a saving if ordered now.

Sheet-rollers and others catering especially to automotive consumers look for a much quicker pace of buying by the middle of October and sentiment generally seems to be that by Nov. 1, the best rate of operations for the year can be confidently expected.

Pig Iron—For the most part the markets rule quiet so far as concerns automotive demand. Representative tonnages are reported to have been contracted for by foundries in other lines of industry, but the tone of the market has been little affected by these, continuing fairly easy.

Aluminum—A sharp increase in exports of aluminum from Canada in August, when nearly 4,500,000 pounds were shipped abroad—nine times as much as in the preceding month—is explained by heavy shipments to the United Kingdom which received 3,500,000 pounds of the metal, reflecting the much heavier demands of the British engineering trades, while the United States took only 200,000 pounds of the Dominion's exports. The market for all grades of aluminum is unchanged.

Copper—Purchase of 2000 tons by Westinghouse Electric & Manufacturing Co., "influenced by sound economic factors, a firm belief that business has turned the corner and as a step to stimulate employment in the basic industries," gave a moral uplift to the market without changing the price of 6¼c, delivered, Connecticut Valley.

Tin—The market opened the week easy with spot Straits quoted at 24.65c.

Lead—The leading interest reduced its contract price further on Monday, the quotation now being 3.30c, New York. A prominent Western seller has withdrawn from the market.

Zinc—Dull and unchanged at 3¼c, East St. Louis.

Mayo, Wilson In Aircraft Move

DETROIT, Sept. 29—William B. Mayo, former executive engineer of Ford Motor Co., is slated to head up a reorganization of Detroit Aircraft Corp., with William Robert Wilson, former head of Reo Motor Car Co. and chairman of Copeland Products, as president, according to reports here.

August Production At New Low Mark

90,324 Built in
Month; July Output
Reached 111,141

WASHINGTON, Sept. 29—The production of motor vehicles in the United States in August declined to 90,324 units, the lowest of the year, according to reports received by the Bureau of the Census from 144 manufacturers.

The July output was 111,141. The August total consisted of 75,898 passenger cars, 14,417 trucks and nine taxicabs.

Output in the first eight months of 1932 totaled 1,072,888 as against 1,978,622 in the corresponding period of last year.

Canadian production in August was 4087 as against 7472 in July.

In the first eight months of the current year the Canadian output was 51,208 as compared with 74,856 in the corresponding period of last year.

Continental DiVco Reduces Prices

DETROIT, Sept. 26 — Continental DiVco Co. have announced the following price reductions in milk delivery trucks:

	Former Price	New Price	Reduction
Model H DiVco, 4 cyl.	\$1,525	\$1,295	\$230
Model K DiVco, 6 cyl.	1,725	1,595	130

John Nicol, vice-president and general manager of Continental DiVco Co. reports that conditions are improving in the dairy truck field, and that the company anticipates an immediate stimulation of business in response to the new DiVco price scale.

H. H. Lind Heads Tool Builders

Herbert H. Lind, Cleveland, has been appointed general manager of the National Machine Tool Builders' Association. For nearly two years he served as general manager of the Malleable Iron Research Institute.

A few months ago he returned to his former work as business consultant and negotiator for industries, in which he had been engaged since 1922, except for the period in which he was connected with the institute. He is about 48 years old and was born in Middlebranch, Ohio. After graduation from high school in Canton, Ohio, he was employed by the Columbus Buggy Co., Columbus, Ohio, as factory clerk in charge of storeroom and later as assistant purchasing agent. After two years with the Columbus Buggy Co., Columbus, he became bookkeeper for the Ohio Blower Co., Cleveland, for which he later became treasurer.

Dickinson to Head S. A. E. for 1933

Vice-presidents and
Councilors Named by
Nominating Committees

NEW YORK, Sept. 27—Hobert Cutler Dickinson, for more than 25 years associated with the U. S. Bureau of Standards, has been nominated president of the Society of Automotive Engineers for the 1933 administrative year.

Other nominations, which will be announced in the October issue of the *S.A.E. Journal*, are:

Vice-Presidents

Clarence M. Young, Assistant Secretary of Commerce for Aviation (Aircraft Engineering).

A. V. D. Willgoos, chief engineer, Pratt & Whitney Aircraft Co. (Aircraft Engine Engineering).

Harte Cooke, McIntosh & Seymour Corp. (Diesel Engine Engineering).

M. C. Horine, sales promotion manager, International Motor Co. (Motor Truck and Motorcoach Engineering).

J. M. Crawford, chief engineer, Chevrolet Motor Co. (Passenger Car Engineering).

Roy F. Anderson, sales engineer, Murray Corp. of America (Passenger Car Body Engineering).

Fred W. Cederleaf, works manager, Muncie Products (Production Engineering).

J. F. Winchester, superintendent of motor vehicles, Standard Oil Co. of N. J. (Transportation and Maintenance Engineering).

Councilors, term of 1933-1934: W. T. Fishleigh, G. W. Lewis and W. G. Wall.

Treasurer: David Beecroft.

Holdover Councilors, term of 1932-1933: S. O. White, R. E. Wilson and H. T. Woolson.

Past-president members of Council: Vincent Bendix and A. J. Scaife.

Dr. Dickinson became connected with the Bureau of Standards in 1903, following his graduation from Williams College with bachelor's and master's degrees, and a graduate course at Clark University, where he was granted his doctor's degree in philosophy in 1902.

From 1921 to 1923 he served as research manager of the society, formulating many of the policies which have since resulted in projects of far-reaching influence in the industry, both in this country and abroad.

In 1923 he again joined the bureau, as Chief of the Heat and Power Division. He is a member of a score of scientific groups in this country and abroad.

For years he has taken a leading part in the cooperative research activities of the society, manufacturers and refiners, and the bureau.

Free Delivery for Long Island Road

Charges To Be Based on Zone System, Will be Identical for All Classifications

NEW YORK, Sept. 27—Free collection and delivery, from door to door, of less than carload freight shipments will be inaugurated on or about October 1, on the Long Island Railroad. Tariffs had been filed with the Interstate Commerce Commission and the New York State Public Service Commission to provide for the free service.

A working arrangement has been perfected whereby less-than-carload shipments, pickup and delivery, will be handled by the trucks of the Railway Express Agency.

This service will, in effect, mean a substantial reduction in freight transport costs on Long Island. For operating purposes the Island has been divided into five separate zones.

Flat rates per hundred pounds, regardless of classification, will be charged for handling shipments between any two zones.

For example, from any address in Manhattan, below 126th Street, Brooklyn and Long Island City, the rates to Jamaica, Flushing and points east to Port Jefferson and Patchogue will be 37 cents per 100 pounds; to Riverhead and Westhampton 42 cents per 100 pounds; and to Greenport and Montauk 47 cents per 100 pounds.

White Machine Activity Steady

EAU CLAIRE, WIS., Sept. 26—One of the best records of any Wisconsin industry is believed to be that of the White Machine Works, manufacturing piston rings, chromium nickel cylinder sleeves, brake shoes, etc.

The full crew has been consistently maintained, with 45 men at work in the foundry and machine shop, producing 5000 rings daily. Most of the business is for replacement, a small percentage of output going into new engines. Distribution is international through jobbers in the United States and fifteen foreign countries.

H. A. White is president and general manager of the company, which started in 1908 as a builder of saw filing tools for sawmills.

In 1911 the concern added a line of replacement brake shoes for Model T Fords, marking its entry into the automotive parts field.

A. O. Smith Recalls 200 Toolmakers

MILWAUKEE, Sept. 26—The A. O. Smith Corp. in the last few weeks has recalled approximately 200 toolmakers, bringing the total payroll to a little fewer than 1800 employees.

The additions are due to increased

activities in the automobile frame department as the result of advancement of work on new models by passenger car manufacturers.

When frame production actually gets under way early in October more men will be recalled, it is stated.

Italian Truck Highway Program is Launched

ROME (Special) — Another important step has been taken toward construction of the Genoa-Milan-Turin truck highway, by a decree authorizing the building of the first section of the road, from Genoa to Serravalle.

Approximately \$5,000,000 has been appropriated for this purpose, and construction will start Oct. 28, just six months after the idea was conceived by Premier Mussolini.

The chief purpose of this highway is to provide high-speed truck service between vessels at Genoa and the industrial plants of Milan and Turin.

Douglas 9 Months Nets 50c a Share

LOS ANGELES, Sept. 27—Douglas Aircraft Co., Inc., reports for nine months ended August 31, 1932, net profit of \$173,388, after depreciation, federal taxes, etc., equivalent to 50 cents a share on 342,304 no-par shares of capital stock. This compares with \$548,571, or \$1.60 a share in the nine months ended August 31, 1931.

For quarter ended August 31, 1932, net profit was \$37,816, after charges and taxes, equal to 11 cents a share on 342,304 shares, comparing with \$137,890, or 40 cents a share, in August quarter of previous year.

Elgin Company Goes to Chicago

CHICAGO, Sept. 28—The Hasty-Johnson Corp., manufacturers of electric equipment, polishing and grinding machines for automobile work, has leased a building here for factory and office, formerly in Elgin.

Andrew J. Smith

Andrew J. Smith, 81-year-old pioneer building contractor of automobile factories, died Sept. 20, at his home in Port Huron.

His firm, A. J. Smith Construction Co., built Ford's Highland Park plant with the exception of the main building on Woodward Ave., two original Paige plants, original Hudson plant, most of the Packard plant and several units for Dodge.

Dodge Dealers Gain

DETROIT, Sept. 21—Dodge dealer organization at end of August was larger than last year by 112 dealers and during the last week in August 11 new dealers were added.

Commercial Car, Truck Registrations Gain

3% Increase Reported by R. L. Polk, Based on Data from 42 States

DETROIT, MICH., Sept. 26 — A further slight improvement in sales of commercial cars and trucks throughout the United States in August was indicated by the weekly report of R. L. Polk & Co.

Registrations in 42 states, which normally account for 92.37 per cent of the United States, showed sales of 14,224 new commercial car and truck units in August. This was 3 per cent greater than the 13,806 units registered in the same states in July, but 43.1 per cent below the 25,004 units registered in those states in August, 1931. Earlier reports had showed August registrations to be running only fractionally ahead of those of July.

On the basis of the latest reports, it was estimated that total August sales reached 15,300.

Insofar as passenger car sales are concerned reports from 44 states showed registrations of 90,820. This total was only 10.2 per cent below the 101,025 units registered in the same states in July, but 39.8 per cent below the 150,988 units registered in those states in August, 1931.

The reporting states normally account for 96.94 per cent; August sales are estimated at 93,000.

French Petroleum Firms Acquire Patent Licenses

PARIS (Special)—The French government about a year ago decided to reestablish the industry of petroleum refining in France by the adoption of a tariff policy favoring the importation of crude oil and discouraging the import of refined products.

It is now learned that as a result of the application of this policy, contracts for the building of a combination primary cracking, vapor phase cracking, and reforming unit, with stabilizer and rerun still have been made with two French oil companies by the Compagnie de Construction de Raffineries, S.A.F.

The units are to be built for Les Raffineries de la Vacuum Oil Compagnie, S.A.F. and the Compagnie Industrielle de Petroles, S.A.F., at Port Jerome, France, and Frontignan, respectively. According to The M. W. Kellogg Co., construction agents for Gasoline Products Company, United States Cracking patent licensing organization, with headquarters in Newark, N. J., the operation of both of the new French cracking installations will be under the Gasoline Products Co.—Socony-Vacuum Corp. license.

The daily charging capacity of each of the French units will be, in the aggregate, about 2700 barrels of topped crude, kerosene, and naphtha stocks.

War Debt Study Headed by Sloan

Group Completes Organization to Study "Practical" Solution Benefiting Whole People

NEW YORK, Sept. 26—The newly organized committee for the consideration of Intergovernmental Debts, which is composed of men of national prominence and has as its object the study of problems arising from the war debts owed to this country by European nations, came definitely into existence yesterday with the election of permanent officers and the announcement of a program for the remainder of the year.

Alfred P. Sloan, Jr., president, General Motors Corp., was chosen permanent chairman; Charles H. Strong, secretary of the Bar Association of the City of New York, secretary, and Henry P. Fletcher, former Ambassador to Italy, treasurer.

The vice-chairmen elected were: Dr. Nicholas Murray Butler, John W. Davis, Frank O. Lowden, D. B. Robertson, Louis J. Taber, A. F. Whitney, James M. Cox, Henry P. Fletcher, Edward A. O'Neal, Alfred E. Smith, Henry A. Wallace and George W. Wickersham.

An executive committee also was named. It consists of the officers and Thomas J. Watson, president of the International Business Machine Company; Edgar Kobak, president of the Advertising Federation of America, and Frederic R. Coudert.

To Sell Floating Power Mountings for Fords

DETROIT, Sept. 26—Walter P. Chrysler announces that Skinner Motors, Inc., Detroit, manufacturing specialists in parts for Fords, has just been granted non-exclusive license to sell floating power engine mountings for Fords, limited to replacements for Ford four-cylinder cars.

The license was granted on royalty arrangements. This is the second license granted on floating power; the first to Societe Anonyme Citroen.

License granted to Skinner includes rubber and steel parts supporting engine. Skinner will purchase parts from Apex Manufacturing, a subsidiary of Chrysler, and parts will be sold under floating power trademark.

M.A.N. Shows Diesel Truck

LEIPZIG (*Special*)—At the recent Fall fair here the M.A.N. firm exhibited a six-wheeled truck equipped with one of its new six-cylinder 104 hp. Diesel engines.

When the engine is being idled three of the cylinders are automatically shut off, which permits of idling at lower

speed and saves fuel. The tractor-trailer combination has a capacity of 12 tons.

By means of the centrifugal governor the engine speed is limited to a maximum of 1400 r.p.m., while for idling it is limited to a minimum of 280 r.p.m.

Pennsy Rail Car is Now in Commission

Budd-Built Coach Surprises Railroaders

PHILADELPHIA, Sept. 27—The new Pennsylvania Railroad Co. oil-electric pneumatic-tired rail car was put into regular service here today, following months of test work made by the company.

The car, largely of aluminum alloy construction, was manufactured by the Edw. G. Budd Mfg. Co. here.

Among the first passengers were: Pennsylvania Railroad officials; officials of the St. Louis and Southern Terminal Railroad, including President Updegrave; Warren A. Taussig and J. E. Brown of the Cotton Belt System; Duane Van Horn and Frank H. Russell, of the Budd Co., and A. F. Howe (Jr. and Sr.) and F. Giles, New York exporters.

Veteran railroaders marveled at the lightness of the car, which weighs 14,000 lb., instead of 175,000 lb., the usual weight of rail coaches of similar size.

Milwaukee Ford Schedule Steady

MILWAUKEE, Sept. 26—An October schedule holding fully steady with that of September is reported for the Milwaukee Ford assembly plant by E. J. Diefenbach, assistant manager.

The plant is operating four days a week, with a force varying between 350 and 400. Failure to reduce operations is the practical equivalent of an advance, it was pointed out, since the usual trend at this time of year is downward. Sales on commercial units and parts have shown a slight improvement, Mr. Diefenbach said.

The Milwaukee plant started distribution to dealers of a new radio set today. The sets are of a new design produced at an outside plant under Ford specifications and supervision.

Florida's Gas Tax Yields \$1,020,924

TALLAHASSEE, FLA., Sept. 28—Florida's seven-cent gasoline tax yielded \$1,020,924 for the month of August, the state comptroller's office announced today. This compares with \$1,039,991.61 for the previous month.

Gasoline consumption for the month of August totaled 14,584,637 gal., as compared with 14,857,023 in July.

More Iron Cast in August Than July

32 Foundries Report 24% Gain—Steel Output Off 5% — Shipments Higher

PHILADELPHIA, Sept. 27—The production of gray and malleable iron castings during August in 32 foundries reporting to the industrial research department of the University of Pennsylvania was 23 per cent more than in July.

Most of the increase was in gray iron castings for hobbing work, which was 24 per cent larger than last month.

Other gray iron castings and the malleable iron castings had an increase of only 5.5 per cent. On the other hand, the activity in the steel foundries, as measured by their output, declined 5 per cent.

Shipments of both iron and steel castings increased. In the iron foundries this represented the shipments of the increased production, but in the steel plants it was caused by the carrying over of castings manufactured in June. The average price per pound of both iron and steel castings was less than a month ago and a year ago.

Canadian Financing Shows 25% Drop

OTTAWA, Sept. 28—Automobile financing in Canada shows a 25 per cent decrease in August as compared with July and indicates a falling off in financing as compared with the corresponding month in 1931.

The total number of cars financed was 6050 in August, 1932; 6,632 in July, 1932; and 6808 in August, 1931, and the amount involved was \$2,180,573 in August, 1932; \$2,475,027 in July, 1932, and \$2,906,507 in August, 1931.

New cars financed were 1707 in August, 1932; 2087 in July, 1932; and 2188 in August, 1931; while used cars financed were 4343 in August, 1932; 4545 in July, 1932, and 4620 in August, 1931.

Financing of new cars amounted to \$1,022,043 in August, 1932; \$1,245,578 in July, 1932, and \$1,418,134 in August, 1931.

Dr. Russell is Honored By Toronto University

Dr. T. A. Russell, president, Willys-Overland, Ltd., has been elected vice-chairman of the board of governors, University of Toronto. Mr. Russell had been the chairman of the board's finance committee.

Claude C. Hopkins

Claude C. Hopkins, formerly of Lord & Thomas Advertising Agency and a pioneer in writing automobile advertising copy, died at his home near Grand Haven, Mich., Sept. 21.

Canadian August Production Down

4067 Vehicles Made in Month; 46% Less Than Same Period, 1931

OTTAWA, Sept. 27—Production of 4067 cars and trucks in Canada during August was, with the exception of January, the lowest figure reported for any month of the year to date, with 46 per cent under the 7472 cars in the previous month and 10 per cent less than the 4544 cars in August, 1931.

Compared by types of cars the August figures show that trucks advanced to 901 from 699 in July, but this gain was not sufficient to offset the decline in passenger cars to 3166 from 6773.

Customs records show that the number of cars imported into Canada during August dropped to 86 from 114, while during the same period exports advanced to 1566 from 1540. The export figure for August was the highest for any month of this year to date.

Of this month's output 2312 cars were made for sale in Canada, leaving a balance of 1755 cars intended for export. The apparent consumption of cars during the month as determined by adding the 2312 cars made for sale in Canada to the 86 imported, amounted to 2398 cars.

During the next preceding month the apparent consumption, thus computed, was 4887 cars and in August, 1931, it totalled 4140 cars.

Missouri Checks Length of Trucks

CAPE GIRARDEAU, MO., Sept. 28—Officers of the Missouri highway patrol began checking trucks and buses in mid-September under the new state law barring trucks with trailer that have combined length of more than 40 ft. Trucks may have only one trailer.

No trailer may be attached to a vehicle that is used to carry passengers for hire. The length of buses remains at 33 ft. and trucks without trailers may be the same length.

License fees under the law cover the vehicle for which it is issued, with amount of license fixed. This permit is separate from the usual state license registration.

Buses pay \$10 per passenger seat per year, and the permit for trucks is up to 2 tons, \$25; to 3 tons, \$65; to 4 tons, \$100; to 5 tons, \$135; to 6 tons, \$175; to 7 tons, \$225; to 8 tons, \$275; to 9 tons, \$350, and over 9 tons, \$500.

Russian Car Production

MOSCOW (Special)—Passenger cars and trucks produced in the U.S.S.R. during the first half of the current year numbered 9127, as compared

with 7769 and 2448 for the corresponding periods of 1931 and 1930, respectively.

Consumer Magazine Advertising is Off

Radio Broadcasting Gains During August

NEW YORK, Sept. 28—Expenditures by the automotive industry for advertising in September national magazines and farm magazines amounted to \$554,147, a decrease of 67.3 per cent from the total of \$1,698,809 expended in these media for the same month a year ago.

National magazines accounted for \$512,357, a decline of 67.7 per cent, and farm magazines accounted for \$41,790, a decline of 62.3 per cent. Of the total in national magazines, \$287,980 was spent for passenger cars and trucks, \$96,264 for tires and tubes, and \$128,113 for accessories, according to figures compiled from National Advertising Records by Dorrance, Sullivan & Co., advertising agents.

For the first three-quarters of the year the total expenditure for these two media was \$10,949,583, a drop of 27.5 per cent as compared with the corresponding period a year ago. Of this amount, \$10,241,397 was spent in national magazines, a decline of 25.8 per cent, and \$708,186 was spent in farm magazines, a decline of 45.5 per cent.

Radio advertising over national networks during August was ahead of last year by 87.2 per cent with a total of \$127,163 as compared to \$67,944 in August, 1931. For the first eight months radio advertising totaled \$1,627,118, a gain of 98.7 per cent over last year.

Carboloy Announces Cost Saving Plan

DETROIT, Sept. 28—Milled and brazed service, a plan to reduce cost of Carboloy cemented carbide metal cutting tools, is announced by Carboloy Co., Inc.

Milled and brazed Carboloy tools are the same as the regular finished tool except that they require a small amount of grinding to put into operation. By taking advantage of this service, the user can obtain Carboloy tools at less than the regular finished tool price and save a large part of the difference in cost.

AC Spark Plug Cleaner Offered

FLINT, MICH., Sept. 26—The AC Spark Plug Co. has just placed on the market a spark plug cleaning machine which permits of cleaning plugs in a few seconds.

A special cleaning liquid is blown against the exposed portion of the plug by air pressure and removes carbon and oxides from the insulator and the shell of the plug.

Jobbers Invited To Conferences

Four One-Day Meets Sponsored By N.S.P.A. Groups

DETROIT, Sept. 27—Invitations have been extended to a list of approximately 800 automotive jobbers to attend the series of four one-day jobber conferences to be sponsored jointly by regional jobber groups and the National Standard Parts Association.

The schedule of conferences with the local committees in charge of arrangements for each follows:

PITTSBURGH, Wm. Penn Hotel, Oct. 4, E. M. Sheehan, Motive Parts Co. of Pennsylvania, Pittsburgh, chairman; M. F. Wible, Air-Land Motor Parts Co., Greensburg, and C. F. Hoffman, Hoffman Auto Parts, Butler.

DETROIT, Book-Cadillac Hotel, Oct. 6, E. R. Blake, De Luxe Motor Service, Inc., Detroit, chairman, and R. Merrill, Baldwin Auto Parts Co., Detroit.

DALLAS, Adolphus Hotel, Oct. 10, J. P. Miller, Fort Worth Wheel & Rim Co., Fort Worth, chairman; H. C. Macbeth, Standard Service Parts, Inc., Dallas; Carl Hendra, Texas Auto Parts Co., Dallas; J. M. Eagan, Motor Mart, Dallas, and Leslie Bealmer, Dallas Parts Service, Dallas.

MILWAUKEE, Pfister Hotel, Oct. 18, F. S. Heimbach, H. & E. Standard Auto Parts, Chicago, chairman, and Frank F. Flaherty, W. R. Flaherty & Sons, Janesville.

"Our daily personal contacts with jobbers from all sections of the country," says E. P. Chalfant, executive vice-president of the N.S.P.A., "convince us that these meetings will be of real assistance to the jobbers in attendance. From the standpoint of the N.S.P.A. we expect to obtain from them an expression of the current jobber attitude on difficult situations which have arisen within the past year and which will be of guidance to us in the determination of subjects to be considered at our annual convention in Detroit, Dec. 2 and 3."

Each of the four conferences will include a morning and afternoon session and will be concluded in the evening by a banquet and entertainment as arranged by the local committee.

Canadian Quaker State Oil Company Organized

TORONTO, Sept. 27—Quaker State Oil Refining Co. of Canada, Ltd., a subsidiary of the Quaker State Oil Refining Co. of Oil City, Pa., has been organized here.

Complete processing, blending and bulk storage plant was recently installed as part of the company's sales and service policy.

Getchell Advertises Plymouth

J. Stirling Getchell, Inc., has been named advertising counsel by Plymouth Motor Corp.

German Patent Exchange Formed to Lease Licenses

Move Aimed Against Trade Barriers of All Kinds Is Begun With Establishment of Headquarters in New York to Make Interchange of Patents Effective

NEW YORK, Sept. 27—Development of a plan for the international exchange of patent rights on a sale or leasing basis is sought by B. Lilienthal, president of the A. G. Fuer Amerika Interessen, who arrived here from Berlin last week.

Mr. Lilienthal's organization, established in 1931 to further German-American trade relations, hopes to overcome to some extent the handicaps of international tariffs and other trade barriers through the promotion of its plan for the sale or lease of patents, manufacturing licenses and agreements by manufacturers who find their foreign markets cut off by trade restrictions.

At headquarters in the Chrysler Building, Mr. Lilienthal explained that the recent trend toward international trade barriers has forced a decline of about \$35,000,000,000 in world trade since 1929.

In many instances, he holds, the loss can be partly recovered by manufacturers who are in a position to sell or lease the rights to manufacture their products to producers in other countries.

In his work in this country he will act as intermediary for European producers desiring to sell or lease rights to American producers and will also arrange similar deals for American companies with manufacturers in England, Germany, France and other industrial countries.

"Manufacturers in Europe," he said, "have reacted favorably to the

proposal of the A. G. Fuer Amerika Interessen and offices have already been established in Berlin, London and Paris.

"Within a few days after the plan was announced in Germany, the organization received commitments relating to patents and processes to be disposed of in the United States from more than 1000 leading German industries and manufacturing companies. Comparable interest has also been evidenced in England and France."

All branches of air conditioning are of particular interest to European manufacturers at this time, he said, and they are watching progress made here closely.

The plan as outlined by Mr. Lilienthal, according to exporters yesterday, is the first organized attempt to promote patent interchange, but interest in the subject has been keen in this country for the last year.

Establishment of a tariff by England and Canadian tariff changes helped the movement and scores of companies arranged to lease patent rights to British producers last spring.

Among directors of the A. G. Fuer Amerika Interessen, Berlin, are: Dr. Karl von Lewinski, former German Consul General in New York; Dr. K. O. Bertline, director of the Amerika Institut, Berlin; H. E. Muencks, director of the German-American Trade Association; Walter Sudfelt, Dr. Ludwig Treitel, Dr. Justinus Gerschel and Eduard Arnhold of Berlin.

Goodyear Employees On Shorter Hours

Office Workers Now on Five-Day Week

AKRON, Sept. 27—Goodyear Tire & Rubber Co. announced a five-day working week will be effective Oct. 1, to all office workers in order to provide more jobs. Factory men have been on a six-hour day for more than a year.

Office workers from heads of departments down will continue on the present eight-hour day when the new policy is inaugurated, giving them a 40-hour week instead of the present 45-hour week. Salary reductions ranging up to 10 per cent will accompany the reduction in working hours.

The change will eliminate all present need of personnel reduction, and will make places for a number of additional office workers, officials of the company announced.

The shorter working week will be in effect until Feb. 1, 1933, the official statement of the company indicated, and thereafter will depend upon economic conditions.

Paul W. Litchfield, president of Goodyear, heads a commission of the United States Chamber of Commerce which is now making a study of the shorter working week for factory men and the possibilities of extending the plan to factories throughout the country and to the so-called "white-collared jobs" of industry.

The commission is expected to report its findings within a few days, and Goodyear's adoption of the shorter week for all employees at this time is taken to indicate a favorable report of the commission on the question.

Tires and Tubes Yield Million in Taxes

Cars and Motorcycles Bring Only \$866,656

WASHINGTON, Sept. 28—Taxes on tires and tubes yielded \$1,587,732.99 in August for the Bureau of Internal Revenue, while the excise levies on automobiles and motorcycles returned only \$866,655.64.

Taxes on motor trucks were only \$101,343.91, while the return from the taxes on automobile parts and accessories was \$224,241.61.

Taxes on gasoline yielded \$8,944,875.38, while taxes on lubricating oils netted \$822,775.50.

G. M. Dealers' Stocks Lower

DETROIT, Sept. 28—General Motors new car stocks in the hands of dealers showed a decrease of 13,079 cars during August.

Retail sales totaled 37,230 cars during the month with 24,151 delivered by the factory to dealers.

August showed a strong increase over July's retail sales of 32,849.

Trailer Makers Meet in Chicago

CHICAGO, Sept. 28—A group of trailer manufacturers from all over the United States met last week here to form a permanent organization. Harvey C. Fruehauf, Detroit, presided.

The group hopes to win uniformity in state laws regulating trucks and trailers. Speakers pointed out that what is now legal in one state may cause the arrest of the driver in another.

Philadelphia Gets Hartford SKF

PHILADELPHIA, Sept. 28—SKF Industries, Inc., supervising Skayef Ball Bearing Co. of Hartford, Conn., Hess-Bright Mfg. Co., Atlas Ball Co., and SKF Research Laboratory of Philadelphia, have announced the consolidation of the manufacturing activities

of the Hartford plant with the Hess-Bright unit here.

This action will give effect to the advantages of concentration of manufacturing and research activities.

The complete line of products previously manufactured at Hartford will be continued at Philadelphia.

Caterpillar Reports

CHICAGO, Sept. 27—Caterpillar Tractor Corp. reports net loss for August of \$44,394 after charges. Eight months' net loss was \$624,214. Net sales for the eight months' period totaled \$9,787,212.

Hardwood Demand Up, Memphis Finds

MEMPHIS, Sept. 28—Large hardwood exporters report an improvement in orders during the last 10 days, as the domestic trade is somewhat larger because of automotive demand.

Exports, Imports and Reimports of the Automotive Industry For August and Eight Months Ended August, 1932-1931

	Month of August				Eight Months Ended August			
	1932		1931		1932		1931	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories		\$5,054,311		\$10,789,767		\$56,873,473		\$116,073,152
Motor trucks, buses and chassis (total)	2,044	886,626	2,374	1,174,634	26,340	7,523,931	35,042	18,870,654
Under one ton	218	54,307	457	131,504	1,724	460,767	5,598	1,946,151
One and up to 1½ tons	1,641	659,114	1,593	707,624	12,550	4,988,044	25,123	11,282,401
Over 1½ tons to 2½ tons	143	118,458	181	197,496	1,361	1,114,388	2,928	3,457,466
Over 2½ tons	33	42,080	69	110,457	499	901,053	1,088	1,967,162
PASSENGER CARS								
Passenger cars and chassis	2,593	1,583,357	5,699	3,335,203	32,135	18,684,823	67,015	41,096,580
Low price range, \$850 inclusive	2,585	1,263,074	4,744	2,228,155	27,233	13,073,259	53,345	25,662,188
Medium price range, over \$850 to \$1,200 ..	166	153,940	521	501,118	2,802	2,668,200	8,509	8,164,995
\$1,200 to \$2,000	64	86,593	190	267,940	1,047	1,377,850	2,335	3,371,417
Over \$2,000	24	61,862	108	268,805	519	1,355,515	1,274	3,240,326
PARTS, ETC.								
Parts except engines and tires								
Automobile unit assemblies		1,231,488		3,676,257		16,337,792		32,349,917
Automobile parts for replacement (n.e.s.) ..		968,766		2,104,564		9,015,870		10,013,331
Automobile accessories		91,864		203,880		1,067,755		2,455,839
Automobile service appliances (n.e.s.)		86,819		212,530		1,133,002		2,757,621
Trailers	113	95,626	22	11,096	288	233,795	547	188,023
Airplanes, seaplanes, and other aircraft ..	40	344,630	18	351,840	106	994,589	101	1,454,585
Parts of airplanes, except engines and tires ..		140,796		132,281		709,128		1,209,740
BICYCLES, ETC.								
Bicycles	15	406	82	1,597	541	13,122	1,119	28,578
Motorcycles	106	20,100	392	86,519	1,568	353,443	4,736	1,136,414
Parts and accessories, except tires		30,067		50,307		237,425		437,972
INTERNAL COMBUSTION ENGINES								
Stationary and Portable								
Diesel and Semi-Diesel	1	436	76	26,073	26	127,332	246	241,895
Other stationary and portable:								
Not over 10 hp.	453	20,160	396	31,848	2,899	178,956	5,967	466,863
Over 10 hp.	79	34,336	65	44,885	515	273,404	3,598	1,716,868
Automobile engines for:								
Motor trucks and buses	40	9,112	608	54,792	1,547	248,421	4,635	672,971
Passenger cars	1,258	93,186	978	64,397	17,445	1,354,783	15,414	1,234,549
Tractors			1	350	10	17,099	21	5,092
Aircraft	58	119,628	5	28,771	910	650,968	212	1,033,663
Accessories and parts (carburetors)		79,603		212,060		856,211		1,623,963
IMPORTS								
Automobile and chassis (dutiable)	46	11,288	53	66,997	304	173,460	434	500,090
Other vehicles and parts for them (dutiable) ..		5,356		6,606		33,094		43,216
REIMPORTS								
Automobiles (free from duty)	23	74,785	21	15,164	105	158,355	154	111,371

Development of Cracking Process Discussed

NEW YORK, Sept. 26—The fourth semi-annual meeting of the Cracking Development Conference was held here Sept. 14-17. The objective of this committee or conference is to correlate experimental and plant development work in pyrolytic cracking which is carried on in the laboratories and refineries of The Texas Co., Standard Oil Co. of Indiana, Gasoline Products Co., and the M. W. Kellogg Co. Previous conferences have been held in Los Angeles, Whiting, Ind., and Port Arthur, Texas.

The Cracking Development Conference meets twice a year to review technical development and to consider methods of processing applicable to the cracking field. During recent years the subject of cracking has become of increasing general importance because of the new demands for improved anti-knock gasoline of higher octane number adaptable as motor fuel for use in engines designed for higher compression ratios. Cracking technology has become ramified, its literature voluminous.

The conference serves as a clearing house for improvements in processing methods, and acts as a committee on standards used in the design of cracking equipment. Improvements, favorably passed by the conference, are

then incorporated by the Kellogg Co. as engineering and licensing agents, in designs for new cracking installations and for remodeling present cracking equipment of licensees of Gasoline Products Co.

The latter company is concerned with the licensing of patents of a number of cracking processes, such as Cross, deFlorez, Holmes-Manley, and the Tube-and-Tank process. Development of new features in the design and operation of equipment for pyrolytic cracking is a function of several associated refineries. Designs and improvements pertaining to the several processes, as well as combination units, are licensed to the industry under the scope of cracking patent rights of Gasoline Products Co.

Sewall Promoted By B. F. Goodrich

William Sewall, formerly advertising manager for the Hood and Miller tire divisions of the B. F. Goodrich Co., has been named sales promotion manager of the tire sales divisions.

Sewall is succeeded as advertising manager by M. G. Huntington who will direct advertising for the Miller, Hood, Brunswick and Diamond tire divisions. K. E. Hopkins will be assistant advertising manager. Huntington formerly did the advertising for Brunswick and Diamond tires.

G. E. Demonstrates New Automatic Welding Head

SCHENECTADY, Sept. 28—A welding head, developed by General Electric engineers for automatically welding with heavily coated electrode, was demonstrated here today and yesterday.

In perfecting this equipment, General Electric engineers have been guided by long years of experience in automatic welding, both in the design of equipment for industry and for use in the fabrication of G-E products.

This new machine carries automatic welding into the field of high quality, high speed welds—something that has never before been done.

The new equipment, which consists essentially of a heavy-duty automatic head with a device for conducting the current to the electrode, will have a capacity for heavily coated electrode up to five-sixteenths of an inch in diameter and is rated up to 600 amperes.

Liden Co. to Make Clevises

LANSING, Sept. 28—Liden Mfg. Co. has filed articles of incorporation and will produce a stamped clevis adapted to use on automobiles, farm machinery, etc. It is the invention of Gus F. Liden, head of the company.

Fewer Canadians Use Automobiles

1931 Shows First Drop in History With 1,206,836 Vehicles

OTTAWA, Sept. 28—In 1931 for the first time registrations of motor vehicles in Canada showed a decrease.

Total registrations last year, including automobiles, trucks, buses, etc., were 1,206,836 vehicles, compared with 1,239,888 in 1930, and 1,195,594 in 1929.

The "density" decreased from one motor vehicle for every 8.2 persons to one for every 8.6 persons in 1931.

Nova Scotia, Prince Edward Island and Quebec showed increases but all the other provinces recorded decreases. Saskatchewan had the largest decrease, 21,298 vehicles. Alberta followed, 6966, and Manitoba, third, 3744.

Prince Edward Island had 7744 motor vehicles; Nova Scotia, 43,735; New Brunswick, 33,730; Quebec, 179,572; Ontario, 563,824; Manitoba, 75,564; Saskatchewan, 108,563; Alberta, 95,686; British Columbia, 98,220; Yukon, 198.

The total number of passenger cars on farms in the Dominion is shown as 321,306. Ontario had the greatest number, 125,716.

The report indicates that 71 per cent of the passenger automobiles registered in Saskatchewan were on farms; 56 per cent in Prince Edward Island; 54 per cent in Alberta; 49 per cent in Manitoba, and only 13 per cent in British Columbia, and 18 per cent in Quebec.

The total revenue collected by the provinces of the Dominion from motor vehicle operators and dealers in 1931 amounted to \$42,231,027, which was \$590,481, or 1.38 per cent less than the total for the previous year.

The Dominion Bureau of Statistics shows the revenues from registrations, licenses, etc., amounted to \$19,684,908, as against \$20,166,283 in 1930.

Gasoline consumption by motor vehicles was approximately 461,165,941 gal., a decrease of 1.3 per cent from 1930, and revenue collected in taxes, despite increased tax on gas by several provinces, dropped by \$109,106 to a total of \$22,546,119. During the year 1270 persons were killed in motor accidents.

Overseas Auto Club Begins Season's Work

NEW YORK, Sept. 27—The fall and winter season of meetings of the Overseas Automotive Club opened last week at a luncheon at the Hotel Astor, attended by about 30 export managers. Short talks were made by P. A. Karl, export manager, Brunner Mfg. Co.; H. G. Farwell, export manager, Raybestos-Manhattan Co.; C. M. Peter, export manager, Black & Decker Mfg. Co., and George E. Quisenberry, sec-

retary of the club and editor of *The American Automobile* (Overseas Edition).

Mr. Karl discussed credits, saying that many of the territories in which automotive exports normally were the largest, were without exchange control and to these and to other countries, credits to establish firms need not be questioned. It was only in a few territories—such as Hungary, Greece, Rumania and Uruguay—in which importers were unable to obtain exchange. Mr. Karl stated that in most territories the export manager's problem was still that of salesmanship.

British Report Earnings Data

LONDON (*Special*)—Earnings and employment figures are given in a recent publication of the Society of Motor Manufacturers and Traders.

The best year, from this point of view, that the British motor industry has experienced was 1929, when the number of men employed was 227,796, the number of unemployed being 17,614. In 1928 the number of employed was smaller, and the number of unemployed greater—the totals, respectively, being 212,815 and 22,015. In 1930 the number of employed was 206,514, and unemployed 40,626; and in 1931, employed 193,858, and unemployed 57,462. This year's figures are expected to show an increase in the number of men employed, in view of improved trade.

Turning to the average weekly sums earned by employees in the motor industry, the best period (for which records are available) was the autumn of 1929.

One Seventh of July Output is Exported

14.7% of Month's Production Shipped: 21% of Trucks Are Sent Overseas

NEW YORK, Sept. 28—Foreign shipments and assemblies of American car makers for the first seven months of 1932 aggregated 129,259 units, or one out of every eight cars produced, the National Automobile Chamber of Commerce reported today.

Shipments of trucks abroad accounted for 35,292 units or 21 per cent of the total output for the year to date. Passenger car sales abroad amounted to 93,967 units, or about 11 per cent of the output.

Foreign sales of American vehicles in July represented almost 15 per cent of the output, as against an average of 12 per cent for the seven months' period.

British Gasoline Use Continues Gains

LONDON (*Special*)—Motor fuel consumption in Great Britain has increased from year to year almost regardless of vehicle sales, registrations, exports and imports.

In 1913 this was 101,049,061 Imp. gal. After the war had ceased to complicate the records, there was a steady yearly increase, with the sole exception of 1926-1927, when there was a decrease in the consumption of approximately 3,000,000 gal.

+ + CALENDAR OF COMING EVENTS + +

FOREIGN SHOWS

London, Olympia ShowOct. 13-23
Glasgow, Scottish Motor Show...Nov. 11-19
Paris, Aeronautical Show...Nov. 18-Dec. 4

CONVENTIONS

Amer. Institute Mining & Met. Engrs. (Petroleum Division), Dallas, TexasSept. 30-Oct. 1
National Metals Congress, BuffaloOct. 3-8
S.A.E. Production Meeting, BuffaloOct. 3
Amer. Society for Steel Treating, BuffaloOctober 3
Amer. Institute Mining & Met. Engrs. (Iron & Steel Division), Buffalo, N. Y.Oct. 3-6
National Safety Council, Washington, D. C.Oct. 3-7
American Welding Society, Buffalo, N. Y.Oct. 3-7
American Society Mechanical Engineers, Buffalo, N. Y. (Natl. Iron and Steel Meeting).....Oct. 3
Empire State Dealers Assoc., Niagara Falls, N. Y.Oct. 4-5

S. A. E. Annual Transportation Meeting, TorontoOct. 4-6
American Gas Association, Atlantic City (Annual)Oct. 10-14
Natl. Hardware Assn. (Accessories Branch), Atlantic City, N. J.Oct. 17-22
Natl. Tire Dealers Assoc., Atlanta, Ga.Nov. 14-16
American Society Mechanical Engineers, New York City (Annual Meeting)Dec. 5-9
Natl. Exposition of Power & Mechanical Engineering, New YorkDec. 5-10
Nat'l Automotive Parts Assoc.Dec. 12-14
Highway & Building Congress, DetroitJan. 16-23
American Soc. for Testing Materials (Annual Meeting)....June 26-30

SHOWS

Joint M.E.A. & N.S.P.A. Trade Show, DetroitDec. 5-10
National Automobile Show, New YorkJan. 7-14, 1933
National Automobile Show, ChicagoJan. 28-Feb. 4, 1933
Kansas City AutomobileFeb. 11-18



"A NOTEWORTHY CONTRIBUTION TO BETTER GEAR MAKING"

Was the expression used by a prominent shop executive in referring to the new Fellows Gear Measuring Machine.

This machine provides the means for accurately checking, not one, but all of the essential elements of gear teeth, and in a manner that can be easily accomplished and understood by the average mechanic.

It places in the hands of the manufacturing department facilities for producing still better gears at lower costs, and represents a further measure of control inherent in the Fellows Gear Shaper Method.

If you are interested in what this new machine will do for you, write for a copy of the circular describing its principal features.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont, U.S.A.
616 Fisher Building, Detroit, Michigan

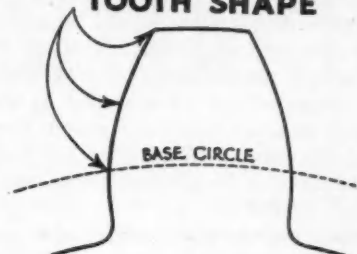
FELLOWS

~ GEAR SHAPERS ~

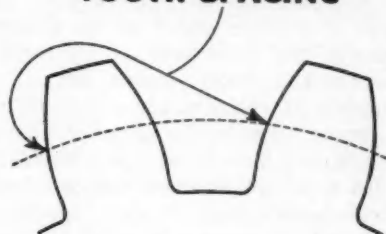
Automotive Industries

A close-up showing the new Fellows Gear Measuring Machine set for measuring the involute profile of a helical gear tooth. Quick changeover sets measuring units to inspect tooth profile in combination with lead and other essential elements of spur and helical gears.

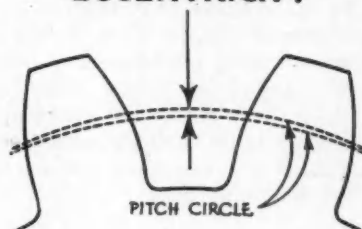
TOOTH SHAPE



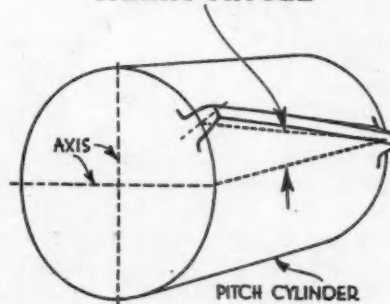
TOOTH SPACING



ECCENTRICITY



HELIX ANGLE



October 1, 1932

Long Heralded Store-Door Freight Service Due Soon

(Continued from page 413)

the consignees fail to accept the goods on the day they are tendered for delivery by the trucking agents of the carriers, the goods will be immediately placed in storage at the expense and risk of the consignees or owners.

The shippers or consignees will be allowed one hour after the trucks are reported at the place of shipment or delivery. After the expiration of this hour of free time extra charges will be assessed at the rate of 75 cents for each quarter-hour or fraction thereof. Extra free time at the rate of 15 minutes for each 5000 lb. or fraction thereof will be allowed when the loads of the trucks exceed 15,000 lb.

The charges for cartage and detention will be collected from the shippers of outbound freight and from the consignees of inbound shipments. Charges for outbound cartage and detention charges will not be advanced by the railroads and placed upon the railroads' freight bills to be collected from the consignees at the destinations of the shipments. They must be paid by the shippers at the time of shipments.

The schedule of charges for collection and delivery includes cartage between the places of business of shippers or consignees located within a maximum distance of two miles from the nearest railroad freight station of the carrier performing the rail service.

The carriers have selected as "C & D Service" basing points 41 freight stations in the Borough of Manhattan, 13 in the Borough of Bronx, 30 in the Borough of Brooklyn, 24 in the Borough of Queens and 163 stations in the 65 communities in New Jersey at which the cartage service will be performed.

The rates charged for either collection or delivery service at all of these points are based upon the actual weight or the minimum carload quantities hauled if the quantities hauled are less than the carload minimum weight at the following rates:

For Freight, the Carload Minimum Weight Is	Rates for Cartage or Delivery in Cents per 100 Lb.
36,000 lb. and over	6
30,000 lb. to 35,999 lb.	7
24,000 lb. to 29,999 lb.	10
20,000 lb. to 23,999 lb.	14
18,000 lb. to 19,999 lb.	16
14,000 lb. to 17,999 lb.	18
10,000 lb. to 13,999 lb.	20

Lower carload minimum weights are as a rule, placed by the Official Classification used by the eastern railroads upon freight of higher value. The sliding scale of collection and delivery rates, therefore, attempts to reflect the relative ability of the goods to bear the rates.

Special rates are made upon a number of commodities, such as newsprint paper in rolls, flour, paper on skids, waste paper, rags, automobiles, van bodies, silk and pieces or packages other than newsprint paper in rolls weighing more than 1500 lb. per piece or package.

A number of articles of inflammable or hazardous nature, fragile articles, perishables, bulk freight, and articles of extraordinary value are excluded from receiving collection and delivery service. Some articles in this category include: acids, explosives, inflammable liquids or gases, live animals, chinaware, earthenware,

pottery, eggs, fish, flowers, fresh fruits and vegetables, household goods, ice, ice cream, milk and cream, butter and butter substitutes, fresh mushrooms, packing house products, paintings and pictures, rugs, silk, watches and clocks, and yeast.

The institution of store-door freight service in a major terminal such as New York is a significant milestone in the history of transportation in the United States, and an event long and impatiently awaited by those who for more than 10 years have looked for such changes as this to evidence substantial progress in the renovation of American transportation practices to meet changed industrial and commercial conditions.

The plan, now that it has come, is apt to disappoint many. Five years or more ago this plan would have merited acclaim as a substantial step forward but now . . .

Too many changes have taken place in the last eventful half decade in transportation, in industry and in commerce which make the plan of less significance. There was a time when shippers and consignees were so accustomed through long familiarity with the sort of terms, conditions, restrictions, limitations, exclusions and warnings that bind this arrangement with red tape, that the restriction placed upon this service would have been taken for granted or they would have groaned and borne them for lack of anything else to do.

Not so now.

The ancient laws of the Medes and Persians in transportation have been shattered by that iconoclast of transportation, the motor truck, so that the time-honored restrictions appear somewhat archaic.

The cartage rates also appear to be ridiculously high for the transportation of freight for two miles or less in solid truckload lots. Quotations from several truckmen, who must for reasons easily understood remain anonymous, would be willing to have such freight as this at substantially lower rates, and it is done for less in the cities of eastern Canada in which collection and delivery services are performed.

The long-expected thunderstorm dreaded by terminal trucking companies and awaited with anxiety by shippers has the appearance of being only a gentle shower.

Chronolog Records Productive and Lost Time

(Continued from page 425)

It is apparent that a daily or weekly summary of causes for idle time with total number of minutes, analyzed by production management, provides an excellent set of statistics as to the efficiency of not only the various departments, but also of the particular equipment and personnel responsible for increasing or decreasing the overall efficiency. Further it provides a ready indication of where materials-handling methods can well be improved profitably, it would show where the methods of tool grinding can be improved upon; where there is a superfluity of, or inadequacy of supervisory or non-productive personnel, such as inspectors, set-up men, machine repairmen, etc. It would show readily where machine tools have reached the stage of economic obsolescence.

UNIFORMITY

of basic material is important in

PARTS MAKING

Uniformity throughout, to a very high degree, is necessary for safe and economical parts making; adequate manufacturing resources and unremitting vigilance over every operation must be devoted to maintaining it.

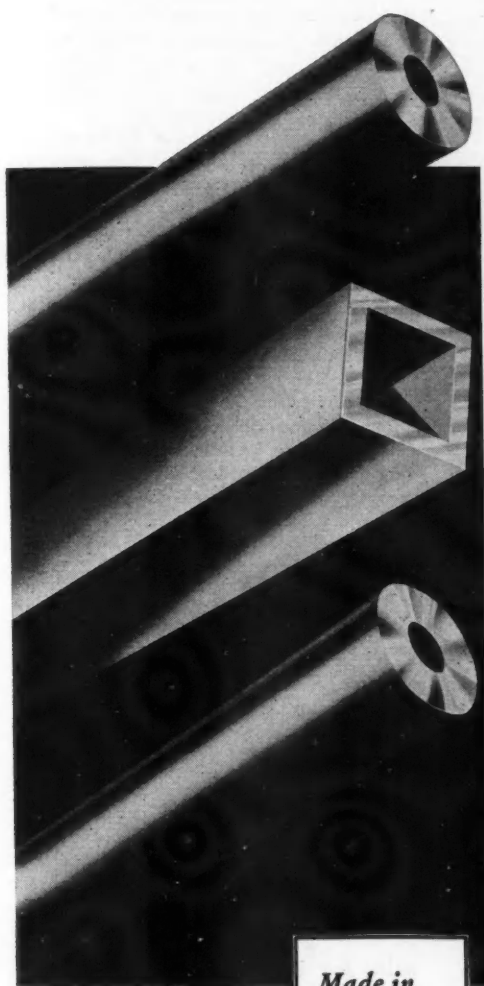
In the making of NATIONAL-SHELBY Seamless Tubing every factor is under a single control; and materials, processes, inspections and tests are employed without stint or compromise in order that uniformity may be secured. Not only a new measure of economy in production but a new measure of certainty in results is brought about when this uniform product is used in the making of automotive parts. It is adaptable to uses far more numerous and varied than might be supposed.

An informative handbook, "Seamless Tube Standards", will be mailed on request. Correspondence as to your special requirements is invited, and careful advice will be given concerning any intended use of NATIONAL-SHELBY—

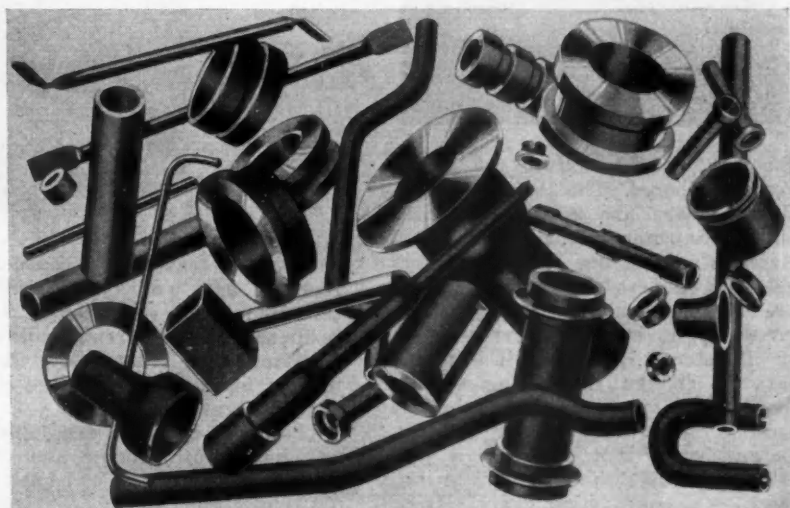
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NATIONAL-SHELBY SEAMLESS TUBING

Automotive Industries

October 1, 1932

NEW DEVELOPMENTS

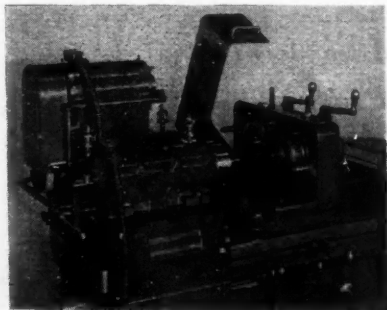
Automotive Parts, Accessories and Production Tools

Precision Boring Machine For Bakelite Canvas

Details of motor boring units and holding fixture used on the Ex-Cell-O Precision Boring Machine, Style No. 216, designed for boring a $\frac{1}{8}$ in. diameter and a $2\frac{1}{2}$ in. diameter hole in steel hubs in Bakelite canvas timing gears and a $\frac{1}{8}$ in. diameter hole in motor end frames have been released by the Ex-Cell-O Aircraft & Tool Corp., Detroit, Mich.

Two types of motor driven boring units are used in this application. The boring unit at the back has a separate standard motor mounted in the same bracket as the boring spindle with the two units connected by a belt. The boring unit in front has a self-contained inbuilt standard motor mounted directly on the same shaft as the boring spindle.

The holding fixture which is used for this application consists of a two-station fixture and the cover is in the open position to show a timing gear and motor end frame in position. At



the back of this fixture the timing gears are bored. The Bakelite canvas timing gears are located from the outside diameter in locating rings and clamped against one face. Adapters are furnished so that the two gears are interchangeable in the same fixture. By having such a wide range of diameters to be bored it is necessary to change the boring spindle speed. This is accomplished by reversing the pulleys used on the motor and boring unit.

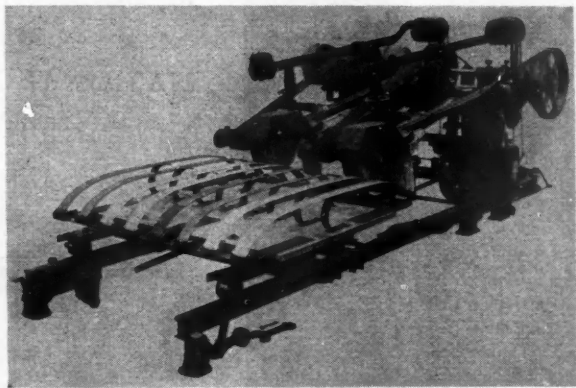
The material to be bored in the Bakelite canvas timing gears is soft steel and in the motor end frames the bushings are made of bronze. Approximately 0.015 in. stock is removed during the boring operation of the steel parts and 0.008 in. to 0.010 in. on the bronze.

The holding fixture is so designed that motor end frames and the Bakelite canvas timing gear with a $\frac{1}{8}$ in. diameter bore can be bored in the same operation. It is estimated that the gross production on these parts is approximately 112 pieces per hour. When boring the large diameter bore the estimated production is approximately 72 gears per hour.

Excelsior Automatic Bumper Polishing Machine

The Excelsior Tool & Machine Co., East St. Louis, Mo., announces the No. 27B Automatic Bumper Polishing Machine for the new type, high curved and edge bent bumpers of modern design.

This machine is so designed that the pressure applied to the polishing wheels is equalized by patentable features, resulting in the elimination of severe wear on the wheels when passing up the curved surface of a bumper. Bumpers passing under



the wheels traveling in opposite directions are polished uniformly throughout their entire length. Lateral resiliency of the carriage allows the polishing wheels to follow the contour of bumpers if they are slightly curved edgewise.

The lower carriage is adjustable to any length of bumper and can be stopped at both front and back travel position. The upper carriage, on which suitable quick releasing hold-down fixtures to accommodate 8 bumpers are fastened, is shifted sideways to the next bumper at the end of the forward or back stroke by the turning of a hand wheel and locking de-

Osborn Adds Line of Materials Handling Equipment

According to a recent announcement, The Osborn Mfg. Co., Cleveland, Ohio, has added a complete line of overhead materials handling equipment, to be known as Osborn Tramrail Systems.

Osborn Tramrail Systems are said to have been designed to meet practically every condition encountered in the installation of overhead materials handling equipment. The equipment is built for capacities up to three tons.

Products of other divisions of the company are: Foundry molding machines, sand treating and sand and mold handling equipment, and a complete line of industrial brushes.

vice used for this purpose.

By this process the bumpers are always in plain view of the operator. The bumpers pass under the polishing wheels from 2 to 8 times, in accordance with the finish required before the upper carriage is shifted to the next two bars.

Special attachment can be obtained to polish edge bent bars. This attachment consists of two brackets bolted to the lower rails on the right-hand side, on which is fastened a retainer bar to support a correspondingly shaped guide to suit the shape of the edge. A sliding bar attached to the lower carriage has corresponding

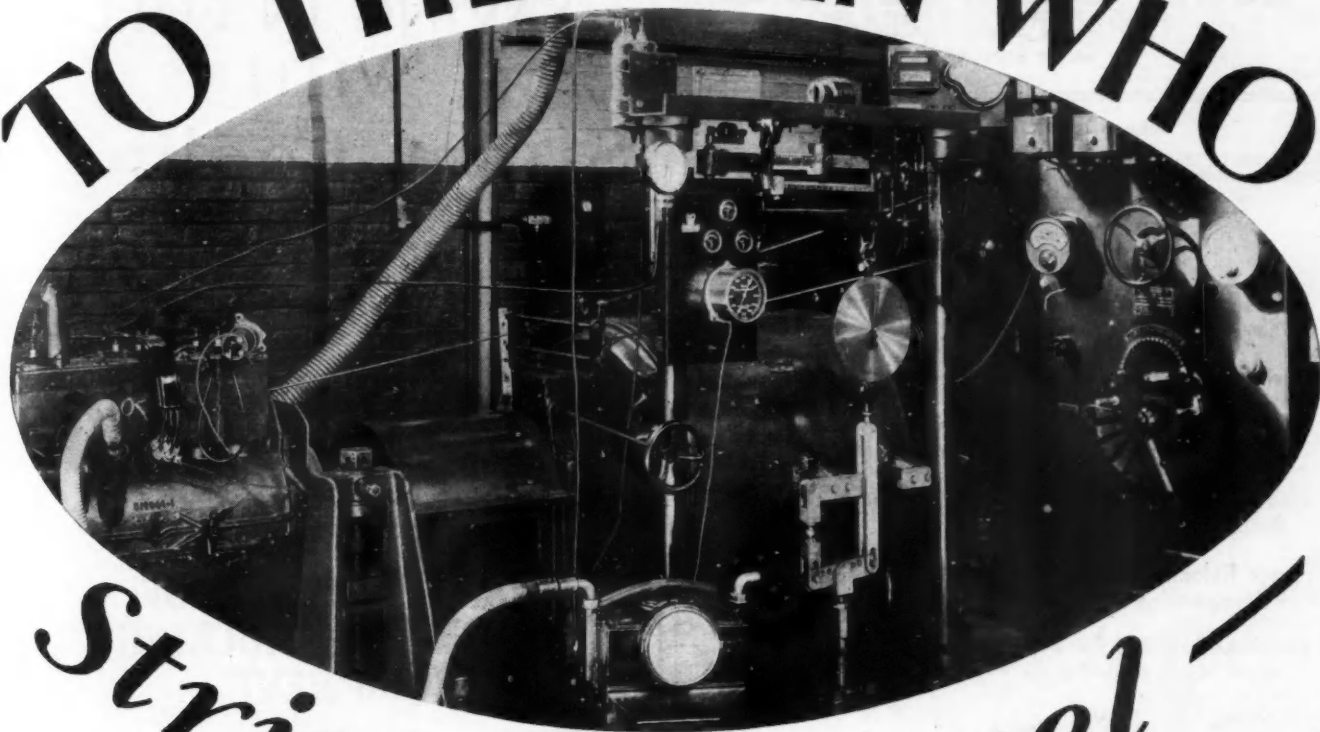
holes for locating the exact spacing of the 8 bumpers on the upper carriage. This sliding bar, at the contacting end with the guide, has a roller which contacts the guide and moves the upper carriage sideways corresponding with the shape of the edge curve of the bar, allowing the polishing wheels to remain on the center of the bumper the full stroke.

The motor is a 20 hp., 1900 r.p.m. ball-bearing, dust-proof type with magnetic switch and push-button control. The motor drive pulley consists of 8 V-type belts with take up adjustment.

Weight of the machine is 5600 lb.

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